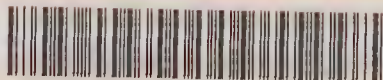




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Order GALLINÆ.

Bill short, high at the base, more or less curved, the tip vaulted and bent down; nostrils pierced in a capacious membrane, covering the base of the bill in some. Wings short, ample, and generally rounded. Tail very variable, of from 12 to 18 feathers. Legs and feet stout; tibia feathered to the knee (except in *Pedionomus*). Tarsus frequently spurred. Toes three in front and one behind, which is usually elevated above the plane of the anterior toes; hind toe wanting in some.

Sternum with two very deep emarginations on each side. Entirely ground-feeding and with the habit of scratching for their food.

Fam. PHASIANIDÆ.

Bill strong, high at the base, vaulted at the tip, which overhangs the lower mandible; nostrils apart; face more or less nude. Wings short and rounded. Tail usually lengthened, of from 12 to 18 feathers. Tarsus moderately long, stout, covered in front with large polygonal scales; usually spurred. Anterior toes united at the base by a small membrane.

Mostly of large size; plumage of the sexes differing.

Genus PAVO.

“Bill lengthened, slender, the nareal portion large; nostrils linear; head ornamented with an erect crest of feathers of a peculiar structure, orbital region naked. Tail moderately long, of 18 feathers. Feathers of the back and upper tail-coverts of great length, surpassing the tail, and beautifully ocellated. Tarsi rather long and spurred.” (*Jerdon*, B. of Ind. iii. p. 506.)

PAVO CRISTATUS.

(THE PEACOCK.)

Pavo cristatus, Linn. Syst. Nat. i. p. 267 (1766); Blyth, Cat. B. Mus. A. S. B. p. 239 (1849); Kelaart, Prodromus, Cat. p. 131 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 62; Irby, Ibis, 1861, p. 234; Selater, P. Z. S. 1863, p. 123; Jerdon, B. of Ind. iii. p. 506 (1864); Beavan, Ibis, 1868, p. 379; Holdsw. P. Z. S. 1872, p. 467; Elliot, Monog. Phasian. i. pl. 3 (1872); Adam, Str. Feath. 1873, p. 392; Ball, ibid. 1874, p. 426; Hume, Nests and Eggs, p. 510 (1875); Butler & Hume, Str. Feath. 1876, p. 5; Fairbank, t. c. p. 202, et ibid. 1877, p. 409; Ball, ibid. 1878, vii. p. 225.

Pavo assamensis, McClelland, Ind. Rev. 1838, p. 513.

Le Paon (male), *La Paonne* (fem.), Buff. Pl. Enl. 433, 434; *Peafowl*. *Mor*, *Mohr*, also *Manjur*, Hind.; *Nimili*, Telugu; *Myl*, Tam.; *Mabja*, Bhotias; *Mong-yung*, Lepchas; *Mayal*, Dutch in Ceylon; *Pavaan*, Portuguese in Ceylon; *Miyil*, Tamils.

Monara, Sinhalese (Layard).

Adult male. Length to end of tail 45.0 to 50.0 inches; wing 18.0 to 22.0; tail about 24.0 inches, "train" (in old birds) 4 to 5 feet; tarsus 5.5 to 6.0 inches; middle toe 2.9; hind claw 0.5; bill to gape 2.0.

The "train" in a fine specimen in the national collection, British gallery, measures about 4 feet 9 inches.

Iris dark brown; bill pale brown, darker at the tip; orbital skin greyish; legs fleshy brown, toes darker.

Neck and chest metallic prussian or lazuline blue, the centres of the feathers pervaded with a greenish tinge; feathers of the head, upper part of throat, and the sides of the head green, tipped with blue; the ear-coverts, lores, and a streak over the eye black; back "beetle"-green, with scaly or clearly-defined black margins to the feathers, which are circular at the tips; lesser wing-coverts, scapulars, tertials, and the innermost greater coverts buff, each feather with a wavy bar of black; the markings of the scapulars and tertials of a broader type than the others, and glossed with green; secondaries blue-black; greater coverts brilliant purple, the inner webs illumined with green; primaries and primary-coverts cinnamon-red, paler on the outer webs; the blue of the chest changes into deep green on the breast, the centres of the feathers darkest; vent and under tail-coverts brown; shorter upper tail-coverts bronze-green, the tips enclosing a large circular brown patch, in the centre of which is a blue-green circle containing a blackish-blue "eye" or disk; longer upper tail-coverts or "train" the same as the shorter, the ocelli are larger, and the brown ground-colour surrounded by a golden-green and violet circle, the whole feather being illumined with a brilliant metallic gloss; the decomposed portion of the webs of the longer feathers is very bronze; tail brown; crest-feathers blue-green at the tips.

Abnormal forms of crest are sometimes seen. Mr. Bligh writes me of a female, recently shot, which had a double crest—that is, the shaft was produced above the tip, and surmounted again by a second expansion.

Female (India: B. Museum). Crown and in front of the eye chestnut; tips of the crest-feathers brown; throat and sides of the neck adjacent to it white; ear-coverts tipped brownish; beneath the white gorget the neck is ferruginous chestnut, changing to green, the feathers being tipped with whitish, which increases on the chest; back, wings, and upper tail-coverts brown; the latter lengthened, reaching to within about 3 inches of the tail, and mottled with whitish; greater wing-coverts darker brown than the back and mottled with whitish; quills brown; tail blackish brown; breast and abdomen white.

Young (nestling, partly feathered: B. Museum). Head, back, and lesser wing-coverts rusty brown; face, lores, and under surface buff-white, extending above the eye; hind neck fulvous-brown; median wing-coverts whity brown, the greater series tipped with white, with a subterminal blackish bar; primaries cinnamon-colour; secondaries brownish cinnamon, tipped and barred at the ends like the coverts; tail brownish, tipped with white.

Immature birds in the first year resemble females.

Obs. Ceylonese examples are quite as fine as Indian. The length of the train varies, of course, with age, and birds of similar age must therefore be compared with one another.

The Burmese Peacock (*P. muticus*), the representative of the Indian species beyond the Bay of Bengal, differs from this latter in having a different crest and a handsomely-coloured facial skin of blue and yellow. The crest reaches a length of nearly 5 inches at times; the feathers are webbed. Crown emerald-green. The feathers of the neck and chest are blue at the bases, with golden-green edges, those of the back metallic green, illumined with bronze and edged with black; the primaries are paler than in the common species, the secondaries are brownish green, and the ocelli, though of similar colour, are smaller, and the purple-blue centres are more indented or divided at the upperside by the green.

Distribution.—The Peacock is essentially a bird of the dry districts of Ceylon. It is comparatively unknown in the humid district south of the Maha-oya (W. Province), and in travelling eastward from Galle is first met with shortly after leaving Tangalla. It is tolerably plentiful in the eastern portion of the Girawa Pattu, and its numbers increase towards the east. In the Hambantota, Kirinde, and Yāla districts it is as abundant as anywhere in the island, but it does not extend (at any rate in large numbers) further inland than the southern portion of the Wellaway Korale. It is tolerably numerous throughout the maritime parts of the Park country, as far north as the Batticaloa Lake, and is likewise plentiful in the interior of that district. Northward of this again it is numerous beyond Vendeloos Bay, and inland through the delta of the Mahawelliganga to the Vellai-Plains district. Round Tamblegam Bay, and thence towards Kanthclai tank, it is common; and near the Bay I have seen as many as twenty in a flock. Immediately to the north of Trincomalie it is not common, probably owing to the manner in which it has been shot away by the natives for the market in the town. But

beyond Tirai, as far as Mullaittivu, and northward of that place to the Jaffna Lake, is the home of the Peacock in that part of Ceylon; and from the sea-board it seems to extend inwards in many places, as it is found in the forest bordering some of the tanks in the heart of the Vauni. On the opposite coast, from Jaffna down to Manaar, and as far south as the Puttalam district, it is likewise tolerably plentiful, but confined there to certain localities. Mr. Parker records it from Uswewa and from the Anaradhapura district; but in such central localities it is not nearly so common as on the sea-board. It is found, I believe, on the banks of the Mahawelliganga up to its outflow from the easteru ranges, but I do not know of its ever having been obtained anywhere in the hills themselves.

Jerdon tells us that the Peafowl inhabits the whole of India proper; but it appears to be local in its distribution, keeping to forest and well-wooded districts. According to him it ascends the Nilghiri and other South-Indian ranges to an altitude of 6000 feet, but not the Himalayas above 2000 feet. It is somewhat noteworthy that it affects such elevated districts, when it is strictly a low-country bird in Ceylon; in fact it seems to prefer hills to flat country in many parts of India, probably, however, because the latter is, to a great extent, either under cultivation or too bare to harbour it. Mr. Ball found it abundant in the hilly parts of Chota Nagpur, as also in the Orissa tributary state of Mohurbanj, to the south of the Province, where it is revered and consequently strictly preserved from molestation. The same writer, in his recent paper (*Str. Feath.* 1878, vol. vii.), records it from the Rajmehal hills, Sambalpur and Orissa, north of the Mahanadi, and likewise from Nowagarh, Karial, and Jaipur. Mr. Hume notes it from Raipur in the Central Provinces. In the north-west of the empire it is found everywhere in Rajputana and Guzerat where there is cover, for it is held sacred and protected by the natives. Captain Butler says that it abounds in the jungles at the base of Mt. Aboo, and remarks that in the neighbourhood of villages it is quite domestic in its habits. It does not extend into Sindh.

In the Deccan Messrs. Davidson and Wender say that it is common in suitable localities; and in the Khandala district it is found, according to the Rev. Dr. Fairbank, in wooded hills and ravines, but is not abundant; he likewise records it from the northern base of the Palani hills, and Mr. Elwes notes it from the Cardamum hills in Travancore. In the central portions of Upper India, Messrs. Anderson, Marshall, and others all bear testimony to its distribution and abundance in some parts of that region.

It has been sought to introduce the Peacock into some places with a view to turning it out as a wild bird; and as such it appears to have existed in St. Helena; but Mr. Melliss writes (*Ibis*, 1870, p. 103) that "the farmers found it so destructive to their gardeus, that they took every opportunity of killing it; consequently, about half a century ago, they were exterminated."

The *habits* of the Peacock are perhaps too well known to necessitate my writing much on the subject; but as many of my readers have had no acquaintance with this beautiful bird in its wild state, it will not be out of place for me to say something on that head. As an inhabitant of its native wilds it is an extremely wary bird, although, as we have seen, when it is strictly protected and induced thereby to frequent the neighbourhood of villages, it becomes the reverse of shy. Mr. Adam bears testimony to its instinct in this matter when he writes concerning it in Rajputana that the parent birds keep their young after being hatched well out of sight, "but as they grow up, *no danger being anticipated*, the young are brought on to the roads and about the temples without fear." In Ceylon it inhabits, by choice, forest-groves (consisting of large trees, combined with underwood) in the vicinity of secluded open places, in which it loves to feed in the early morning, rejoicing in the complete retirement afforded it by these wild haunts; it also affects the dense low jungle clothing the shores of the Eastern Province, coming out to feed on the grassy borders of rivers and salt lakes. In these localities it is most difficult to shoot, for it threads its way through the scrub with marvellous rapidity, decamping at the least sound of a footstep on the dry grass. On taking alarm, it will stealthily enter the jungle; and if a rush be made to the spot in hopes of getting a running shot, the sportsman will be surprised to find that his "game" has entirely disappeared, sounds of its retiring footsteps, far beyond the range of his vision into the thicket in front of him, being the only sign of the fine bird which he has just seen, and will not see again that morning! I have watched one from a distance, threading its way through a number of isolated clumps of scrub on the borders of a salt lagoon in the Kiriude district, and been surprised to notice how quickly it got over the ground, its long beautiful train whisking from side to side as it avoided the stumps and

branches in its way. After feeding in forest-districts it is its habit to mount up to the lower limbs of large trees and dry the morning dew from its plumage; and it is a fine sight to see a number of these splendid birds in this elevated position at the edge of a grove. They will remain preening themselves until approached within a few hundred yards, and then disappear at once into the scrub beneath them. Towards evening, I have noticed that they again take to trees, and rest on large limbs, where they can have an outlook on the surrounding thickets and easily apprise themselves of any danger. Emerson Tennent, in writing of the forest solitudes of the Park country, speaks thus of the Peafowl which frequent them:—"As we emerge from the dark shade and approach the park-like openings on the verge of the low country, quantities of Peafowl are to be found, either feeding on the seeds among the long grass, or sunning themselves on the branches of the surrounding trees. Nothing to be met with in English demesnes can give an adequate idea of the size and magnificence of this matchless bird when seen in his native solitudes. Here he generally selects some projecting branch from which his plumage may hang free of the foliage; and if there be a dead and leafless bough, he is certain to choose it for his resting-place, whence he droops his wings and suspends his gorgeous train, or spreads it in the morning sun to drive off the damps and dews of the night."

As Jerdon truly remarks, few sportsmen resist a shot at a fine Peacock whirring past them, although it is not a favourite game, old birds being tough and unfit to eat. The young Peahen, however, when cooked in an orthodox fashion, is excellent eating; and these birds, as the native Shikarees knew well, were not by any means despised by the garrison in the Fort of Trineomalie, a locality not famed for the quality or quantity of the butcher's meat.

The *Pitta*, more than any bird in Ceylon, has been the subject of legends with the inhabitants of the country; and I have already, in previous articles, referred to some of these. There is one mentioned by Emerson Tennent, connected with the Peacock, to the effect that this bird stole the plumage of the *Pitta* or *Avitchia*, whose singular cry the Singhalese liken to the word *mat-ki-ang*, which means, "I will complain;" and this, "they believe, is addressed by the bird to the rising sun, imploring redress for its wrongs"!

Mr. Elliot, in his magnificent 'Monograph of the Phasianidæ,' gives the result of his observations of the Peacock in the Terai in the following interesting paragraph:—

"In the months of December and January, the temperature in the forests of Central India, especially in the valleys, is very low, and the cold (from sudden evaporation) intense at sunrise. The Peafowl in the forest may be observed at such times still roosting, long after the sun has risen above the horizon. As the mist rises off the valleys, and, gathering into little clouds, goes rolling up the hill-sides, till lost in the ethereal blue, the Peafowl descend from their perch on some high seemul or saul tree, and, threading their way in silence through the underwood, emerge into the fields, and make sad havoc with the chunna, ooid (both vetches), wheat, or rice. When sated, they retire into the neighbouring thin jungles, and there preen themselves, and dry their bedewed plumage in the sun. The cock stands on a mound or fallen trunk, and sends forth his well-known cry, *pehaun-pehaun*, which is soon answered from other parts of the forest; the hens ramble about or lie down dusting their plumage; and so they pass the early hours while the air is still cool, and hundreds of little birds are flitting and chirruping about the scarlet blossoms of the polâs or the seemul. As the sun rises and the dewy sparkle on the foliage dries up, the air becomes hot and still, the feathered songsters vanish into shady nooks, and the Peafowl depart into the coolest depths of the forest, to some little sandy stream canopied by verdant boughs, or to thick beds of reeds and grass, or dense thorny brakes overshadowed by mossy rocks, where, though the sun blaze over the open country, the green shades are cool, and the silence of repose unbroken, though the shrill cry of the Cicada may be heard ringing faintly through the wood. There are spots in these saul-forests which, for luxurious coolness during the sultriest weather, rival the most elaborately devised recesses of the Alhambra, or the tinkling fountains of Isfahan; and the wilder denizens of the woods show no small discernment in selecting them. In such lovely retreats one might cheat the hot hours of noon, and rob them of their discomfort; but, alas! these are the spots where lurks malaria, and, moreover, where one may be very apt to intrude on the privacy of some misanthropic tiger!" Other writers, likewise, tell us that the natives believe tigers always frequent forest where Peacocks abound.

In a state of nature the Peacock is chiefly granivorous, feeding on seeds, grain, and buds, but it likewise consumes insects; in a domestic state it is, as we all know, omnivorous, neither fish, flesh, nor fowl, nor any thing that it can get hold of, coming amiss to it.

A brother officer, who is well acquainted with the Peacock in a state of nature, informs me that the young birds in Bengal resort much to the fields of Jowaree, and afford excellent shooting.

Notwithstanding the showy manners of a fine Peacock as seen in an English demesne, those who have not seen him in a state of nature during the courting-season can form no idea of his pomp and pride when strutting about with tail and train erect for the gratification of his partners; and when half a dozen full-plumaged birds are seen occupying a small opening in the forest, holding one of these displays, each vying with the other in his efforts to exhibit his gorgeous attire, the sight is one not easily to be forgotten. I once came suddenly upon such a *Pavonian* arena in some jungle near Tamblegam; and the sudden change in the performance, as the affrighted actors fled in all directions, was very amusing.

Numbers of Peacocks are caught in India by means of snares, which consist merely of hair nooses; they are then sold alive for the purpose of being domesticated. That it has from the earliest times been regarded with great admiration by eastern nations is unquestionable, and the date of its exportation from India into other countries must be very remote. We have inspired authority as to its being brought to Palestine, and having contributed towards the wealth of Solomon's possessions; and from that country it found its way, most likely, to Greece and Rome. Aristotle wrote concerning it, and (among other facts of its natural history) stated that it laid twelve eggs. After devoting two pages to it, he concludes with the following passage, which, though true in essence, is decidedly uncomplimentary:—"They are pestilent things in gardens, doing a world of mischief; they also throw down the tiles and pluck off the thatch of houses; the Peacock, saith Aldrovandus, though he be a most beautiful bird to behold, yet that pleasure of the eyes is compensated with many ungrateful strokes upon the ears, which are often afflicted with the odious noise of his horrid cry, whence, by the common people in Italy, it is said to have the feathers of an angel, but the voice of a devil and the entrails of a thief. It is said (and I can easily believe it) to produce its life to an hundred years."

Nidification.—In the Hambantota district the Peafowl breeds from January till April; it lays its eggs in a depression in the ground, lined with dry grass and leaves. Two eggs which I have from this part of the island measure 2.66 and 2.74 inches in length, by 2.1 and 2.28 in breadth respectively. They are stumpy at both ends, and, as can be seen by the measurements, very round; the ground-colour is greyish buff; one of them has faint reddish-grey blotches in a zone near the smaller end.

In India it breeds from July until October, and is variously described as nesting in thick grass, dense bushes, among thick underwood, on sloping banks, or even on the bare ground; and the nest is said to be lined "with a few leaves and twigs or a little grass." Mr. Hume is of opinion that six or seven is the usual complement of eggs; but Miss Cockburn found as many as fifteen in one nest; but it may be that these were not all laid by one bird. The eggs are described as typically rasorial, the shells closely pitted throughout with minute pores, more deeply indented in some than in others; some are thickly freckled with pale reddish brown. The average size of forty eggs measured by Mr. Hume is 2.74 by 2.05 inches.

Genus GALLUS.

Bill rather short, high at the base, the tip much curved and vaulted, and overlapping the under mandible; base of the upper mandible covered with a cere, in which the nostrils are pierced. Wings short, rounded, ample; the secondaries equal to the primaries; the 1st quill much shorter than the longest, which is the 5th. Tail of 14 feathers, divaricate; central feathers much elongated and drooping, curved outwards at the tips. Tarsus stout, covered in front with pentagonal scales and with a stout spur on its inner side; outer toe longer than the inner.

Head furnished with a comb or crest of skin. Face nude. Throat wattled. Neck-feathers hackled.

GALLUS LAFAYETTII.

(THE CEYLON JUNGLE-FOWL.)

(Peculiar to Ceylon.)

Gallus lafayettii, Lesson, Traité, p. 491 (1831); Kelaart, Prodrömus, Cat. p. 131 (1852); Emerson Tennent, Nat. Hist. Ceylon, p. 259 (1868); Elliot, Monog. Phasianidæ, ii. pl. 33 (1873); Hume, Nests and Eggs, iii. p. 530 (1875).

Gallus stanleyi, J. E. Gray, Ill. Ind. Zool. iii. pl. 43 (1833); Blyth, Cat. B. Mus. A. S. B. p. 243 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 62; Sclater, P. Z. S. 1863, p. 122; Jerdon, B. of Ind. iii. p. 540 (1864); Blyth, Ibis, 1867, p. 307; Gray, Hand-l. B. ii. p. 261 (1870); Holdsw. P. Z. S. 1872, p. 468; Legge, Ibis, 1875, p. 400.

Gallus lineatus, Blyth, J. A. S. B. 1847, xvi. p. 387.

Lafayette's Jungle-fowl, Elliot; *Jungle-fowl* of Europeans. *Wild Hoën*, Dutch; *Galienha di Matoe*, Portuguese in Ceylon (Layard); *Kāda-koli*, Ceylonese Tamils.

Weli-kukula (male), *Weli-kikili* (female), Sinhalese.

♂ ad. suprā aurantiaco-castaneus, plumis medialiter lanceolatim purpureis: uropygii plumis latè medialiter purpureis, dorsi colore angustè marginatis: supracaudalibus caudāque chalybeo-nigris et purpureo nitentibus: tectricibus alarum stramineis, medialiter castaneis et ad apicem lanceolatim dorsi colore notatis, majoribus et remigibus chalybeo-nigris: nuchā cum collo postico et colli lateribus stramineis, plumis medialiter longitudinaliter nigro lineatis: facie, gulā nudā et carunculis pendentibus lividè rubris: gutture imo et jugulo purpureo nigris: corpore reliquo subtus aurantiaco-castaneo, plumis longitudinaliter brunneo lineatis: abdomine, tibiis, crisso et subcaudalibus purpureo-nigris.

Adult male. Length of examples with fine tails (which vary in length) 26.0 to 28.0 inches; wing 9.2 to 9.5; tail 13.0 to 15.0; tarsus 3.2 to 3.4; middle toe 1.7 to 1.8, claw (straight) 0.5 to 0.6; bill to gape 1.2.

Length of comb from forehead to extremity 3.2 to 3.3 inches; spur 0.7 to 1.2.

Iris light golden yellow; face, throat, and wattles livid or purplish red; comb bright red, with a large interior yellow patch, brightest in front, and blending into the surrounding colour; bill brownish red, the lower mandible and tip of the upper pale; legs and feet wax-yellow, washed anteriorly with brownish, more especially on the toes.

Hackles and margins of the lesser wing-coverts pale shining golden yellow, changing into the glistening yellowish red of the back, median wing-coverts, chest, breast, and the lanceolate portion of the rump-feathers, and into the duller hue of the head and nape; the feathers with mesial stripes of deep brown on the hind neck and sides and of maroon on the remaining parts, those on the lesser wing-coverts spreading out at the base of the feathers, and more or less edged with dark brown; short feathers of the rump, upper tail-coverts, tail, greater wing-coverts, and outer webs of secondaries metallic greenish black, illumined on the rump with fine amethystine, and elsewhere with steel-blue, reflections; primaries dark brown; upper portion of the fore neck metallic purple-black; belly and



thighs dull black, edged narrowly with rufous; lower part of the sides of the breast and under tail-coverts green-black; ear-coverts whitish, tipped with black.

Female. Length about 13.75 inches; wing 6.8 to 7.0; tail 3.5; tarsus 2.3 to 2.5; middle toe and claw 2.0 to 2.1; bill to gape 1.1.

Iris yellowish olive; bill, upper mandible dark brown, lower yellowish; tarsi and feet brownish in front, yellowish posteriorly.

Above fulvous-brown, the back, scapulars, and lesser wing-coverts with buff mesial lines, and the feathers closely vermiculated with black; the hind neck and sides dusky rufous, with the centres of the feathers blackish; primaries brownish, mottled and indented on their outer webs with rufous; secondaries and greater wing-coverts brownish black, handsomely barred with mottled bands of buff, the black on the terminal portions of the feathers mixed with rufous; tail rufous, mottled with black; chin and gorge whitish; fore neck and sides of chest brown, the former tinged with rufous, all the feathers with pointed white centres surrounded by a black edge; on the upper part and sides of breast the white increases, having a broad black margin; centre of the breast and belly white, marked with blackish brown, except on the abdomen; under tail-coverts as the tail. Specimens from the hills, in addition to being larger than low-country birds, are paler above.

Young. The male chick, when about the size of a Quail-Partridge and able to fly well, has the iris yellowish olive; bill, upper mandible brown, its tip and all the lower mandible yellowish; legs and feet dusky yellow, shaded with brownish; comb developed as a flap about $\frac{1}{16}$ inch high at the base of the upper mandible; spurs in the form of very small tubercles.

Forehead, sides of head, and nape ochraceous brown, a dark rufous, black-bordered, spear-shaped mark running up the nape to a point on the crown; from behind the eye a black stripe running down and back to the nape; interscapular region, scapulars, and wing-coverts rusty brown, mottled with black, the scapulars and coverts with marked white terminal spots and black bars, and the upper back with fulvous mesial lines; primaries brown, with fulvous edges; secondaries and tertials handsomely barred near the edges with buff and black alternately; least wing-coverts rufous; back blackish, edged with rufous and with two broad buff stripes on each side of the centre; chin, throat, centre of breast, and belly white; chest, sides of breast, and flanks light fulvous-brown, with wavy blackish cross rays and whitish mesial lines and tips; in the centre of the fore neck a pale rufous spot. This plumage resembles in general character that of the adult female.

Young male (January). In the bird of the year the iris is light yellowish, the bill much the same as in the chick; the comb and spurs but very little more developed, and the wattles are absent. A considerable change takes place in the plumage, however. The head and upper part of hind neck are yellowish rufous, the feathers with darker centres, deepening into chestnut-red on the interscapular region, sides of neck, and breast; on the lower part of the hind neck the feathers are somewhat elongated, with glossy blackish centres, and there are signs of the dark fore-neck patch; the metallic purple of the adult rump is present in small patches on the feathers; the ground-colour and the tail, which is short, are ferruginous, mottled with blackish, with a greenish-black wash on some of the tail-feathers; wings blackish brown, the secondaries and their coverts handsomely mottled with rufous and buff; chin and gorge whitish, the feathers very short; lower parts nigrescent, tipped with rufous.

Another specimen, not quite so old perhaps, is dark brown on the head; back ferruginous, mottled with black; the hind neck with the centre of the feathers blackish brown and their margins yellow; wing-coverts like the back; secondaries crossed with black-and-yellow mottled bars on the outer webs; primaries dark brown, indented outwardly with yellow; tail ferruginous, with black on the inner webs of the feathers; throat white; chest chestnut, feathers of the breast brown and ferruginous.

The adult plumage is apparently donned during the second year, and then the long tail is assumed, but this probably does not attain its full length until another year.

Obs. *G. ferrugineus*, the Red Jungle-fowl, and probably the origin of the Domestic Fowl, is an inhabitant of Northern and Central India, the countries to the east of the Bay of Bengal, and the Malay islands of the Sumatra-to-Timor chain, and is allied to the Ceylonese bird. It differs notably in having the breast and under surface dull greenish black; the hackles of the neck are deep red, the lower or longer ones which underlie the upper back are yellow with a dark mesial stripe; median wing-coverts deep maroon-red, the lesser and greater series dark green; quills cinnamon-red, brown internally. The wing of an Indian example in the national collection measures 8.0 inches.

The female has the back and wings mottled brown and tawny, many of the feathers with clear yellow shaft-stripes; the hackles are black, with tawny yellow edges; throat and sides of the neck maroon-red; the under surface cinnamon-brown, the feathers with a pale central streak and a paler shaft; tail blackish brown, the feathers mottled with ferruginous. A Javan example measures in the wing 8.0 inches.

The beautiful South-Indian Jungle-fowl, *G. sonnerati*, is larger than either of the above species (wing 10·0 inches) and is notable for the extraordinary structure of the hackles and wing-covert feathers, which terminate in a long lanceolate process, of a crisp leaf-like or waxen aspect, and which are of a glistening yellow-red colour. The feathers of the head and neck are very long, and are black with grey edges and bright white shafts, and a cross bar of the same, while at the tip there is a golden transverse spot; back dark greyish brown, the feathers with grey edges and shaft-streaks and mottled with the same colour; quills brown, with pale edges; secondaries glossed with green; longer upper tail-coverts purple and bronze; underparts grey, with a lanceolate black central streak on each feather, enclosing a white shaft-streak. This is a mere outline description of this species, which, one would think, ought to be found in Ceylon, as it is so common in South India.

Distribution.—The Jungle-fowl is more or less scattered through the dry jungly districts of the low country, and diffused throughout the hills of the Southern and Central Provinces. It is rather rare in the jungles of the maritime portions of the Western Province and south-western district, and is not common even in the forests of the interior. It is occasionally brought into Colombo and Galle by natives, but very seldom indeed into the former town. During my rambles in the jungles of the Hewagam and Rayigam Korales I never heard its note; but further inland, in the Three and Four Korales, in Saffragam, and in the Pasdum Korale, I have listened to its well-known cry. Likewise in the hilly jungles of the south-western district I have not met with it near the sea; but I have seen it about Oodogamma, and further up at the base of the ranges it becomes more plentiful. On the eastern slopes of the Morowak Korale, where a drier climate prevails, it finds a more congenial home, and along the Wellaway river and from that eastward it is numerous. In the maritime portions of the south-east it abounds, delighting in the dense *Euphorbia*-scrubs along the sea-coast. From this section of country round the east coast to the north of the island it is very numerous, and inhabits all the northern forests, extending down the west side as far south as the Kurunegala district. In the hills it is resident and breeds commonly up to about 5000 feet. On the Nuwara-Eliya plateau and up on the Horton Plains it is very abundant during the north-east monsoon, coming up from lower down on the hills, and probably, to some extent, from the low country, to feed on the berries of the nilloo. It is probable that many remain throughout the year in these uplands; but, as I have only visited the Horton Plains in the cool season, I am unable to say whether it is found in that locality to any extent during the wet season. In February and March, 1868, Captain Bayley of Galle informs me, they breed at the Horton Plains in great numbers.

Habits.—This handsome bird, although so very abundant in many parts, is by no means easy to shoot. It dwells entirely in cover, and, though it is fond of frequenting the vicinity of paths and tracks through forest, its sense of hearing is so acute that it removes to a safe distance at the sound of approaching footsteps; and though it will continue to utter its challenge-cry of "George Joyce," it gradually makes its way off behind some protecting hillock or rise in the ground which shuts out the road or path from its view. The north-eastern forests are well suited to its habits, the ground being covered with dry leaves, which do not decay so soon as in the humid jungles of the south; and among these, harbouring a multitude of seeds, insects, and grubs, it scratches exactly after the manner of its domestic race. This scratching may often be heard on a still morning at some distance away; and if the bird be behind a mound or little eminence it can be approached if the sportsman is cautious and makes no noise.

The Jungle-fowl roosts at a considerable height from the ground, choosing a good-sized branch to perch upon, and up to which it flies at an early hour in the evening; for the jungle swarms with hostile vermin, and its instinct teaches it to leave *terra firma* before the shades of evening spread a gloom through the thick forest. At daybreak in the morning they fly down from their roost, and while the cocks challenge each other with loud calls of "George Joyce, George Joyce," every now and then flapping their wings as they walk slowly about, the hens, if they have a brood of chicks to tend, lead them out into open places or into roads, where they scratch surrounded by their family, precisely after the manner of a barn-door fowl; and so intent are they in thus seeking food for their young, that I have walked down a road to within shot before disturbing them. The cocks are particularly combative in the breeding-season; and when the challenge-note is uttered, if there be another cock within hearing, he replies and flaps his wings, the call is continued, the birds approaching each other, and they will sometimes cross a road in so doing, and thus afford a shot.



GALLUS LAFAYETTI ♂ pull



GALLUS LAFAYETII. ♀ Juv ♂

I never could ascertain whether any actual combats were the result of their meeting, and I think that generally one or other of the birds retreats when it sees its antagonist.

Layard, however, writes on this subject :—"The cocks fight most desperately in defence of their seraglios, the combat frequently terminating in the death of one of the engaged parties. As they not unfrequently mingle with the fowls of the lonely villages, they cross with the domestic breed, being more than a match in courage for the plebeian dunghill cocks, and armed with tremendous sharp spurs.

"Mr. Mitford, of the Ceylon Civil Service," he continues, "showed me, while at Ratnapura, a hybrid hen; her general appearance and call much resembled that of the wild bird; her eggs also partook of the spotted character; but Mr. Mitford never succeeded in rearing any chicks from them, as they were always addled. The bird was very tame to those with whom she was acquainted, but fled precipitately at the approach of strangers."

As a rule, Jungle-fowl do not thrive well in confinement; but several exceptions to this have come under my notice, the birds in question having been reared from the nest. Captain F. Bayley successfully kept a cock for years in his beautiful grotto-like aviary at Galle; and Mr. Thwaites of Ilakgala had some beautiful examples which I saw on the occasion of my last visit to his bungalow, and which, he informed me, he had had for some years in confinement without their having in any way suffered from their captivity. Mr. Holdsworth likewise conveyed some to England which the late Rev. Dr. Boake had reared in an aviary at Colombo.

The sound of the flapping of the wings, which is of course the invitation to battle, has the effect of always drawing two birds together; and the knowledge of this fact has given rise to the device of imitating the noise, by doing which the sportsman can bring the cock up to him, and if he be properly concealed can easily shoot him. The natives make this sound by clapping against their thighs with the palm of the hand hollowed; but Europeans can best do it by making a pad with the handkerchief, and beating it against the palm of the other hand. By this means the *exact* sound can be made; and I myself once procured a very fine specimen in the Ostenburgh woods by adopting this plan. It is worthy of note that this species (and I believe the same is the case with all the wild Jungle-fowl) does not utter its call before daybreak, like the domesticated varieties; and this fact renders it difficult to surmise how the habit first arose in the latter.

The male birds have an alarm-note, sounding like *clock, clock*, which they make, if they hear any strange noise, when perched on a branch and about to roost. I kept a wild bird in confinement for a short time, and being very timid it invariably made this note when I approached, at the same time running round the aviary and trying to escape. The *George-Joyce* call is, as Mr. Holdsworth remarks, preceded by a sharp monosyllabic note sounding like *tek*. This gentleman likewise says that he has seen the cock, when "calling," "strutting up and down a low horizontal branch of a tree, raising and lowering its head" as it gave out its note.

I have remarked in my note on "distribution" that numbers of Jungle-fowl visit the forests in which the undergrowth of "nilloo," a species of *Strobilanthes*, is so abundant, for the purpose of feeding on its berries; and the popular idea obtains that the fruit of this shrub has the effect of stupifying the birds. Certain it is that at this period the Jungle-fowl in the Horton Plains and about Nuwara ELLIYA do become affected, and are apparently so "intoxicated" that they may be knocked down with a stick. Mr. Holdsworth writing on the subject says that he failed to discover that any thing was known to botanists of the seeds of this plant possessing narcotic qualities; and he suggests that the birds may perhaps eat some noxious fungus growing in the woods where the "nilloo" thrives.

Another idea among the Singhalese is that the Jungle-fowl become blind at this season from eating the nilloo-seeds. Mr. Bligh writes me on this subject as follows :—"About that season of the year if village fowls be brought to the hills they rarely escape a serious eye-disease, which rapidly spreads throughout a given district, and in many cases they become totally blind in two or three weeks. This is the disease which the Jungle-fowls evidently catch. A dog of mine caught a jungle-cock with one eye lost, and evidently from this cause."

The flight of the Jungle-fowl is strong; but they rarely take wing unless suddenly surprised, their usual mode of escape from danger being by running, which they do with considerable speed.

Nidification.—In the north of Ceylon the Jungle-fowl breeds in the early part of the year (when I have procured its eggs), and most likely at other seasons as well. In the Hambantota district I have met with

young chicks in July, and in the neighbourhood of Kadugannawa in December, whilst at Horton Plains young have been seen in April; and, finally, in the Kukul Korale I have taken its eggs in August. From this it will appear that it breeds throughout the year. The nest is almost always placed on the ground near a tree, under a bush, and beneath the shelter of a fallen log; a hollow is scratched and a few dry leaves placed in it for the eggs to repose upon. I once found a nest in damp soil between the large projecting flange-like roots of the Doon-tree, containing two eggs partly incubated. I have generally found that the eggs do not exceed two in number, but sometimes three and occasionally four are laid. The general colour is creamy, but some eggs are whiter than others; white specks sometimes prevail all over the shell in the same manner as in the ordinary hen's eggs. Sometimes they are closely stippled with brownish specks or minute points of reddish grey, which occasionally tend slightly to form an indistinct zone at one end, either the smaller or larger. They vary from 1.75 to 2.0 inches in length by from 1.24 to 1.49 inch in breadth.

In 1873 Mr. Parker found a nest on the top of a young tree about 30 feet high. He writes me that it had the appearance of a Crow's or a Hawk's nest, of which the Jungle-hen had taken possession. She flew off, and three eggs were found to be in the nest. After incubation the young would have been doubtless carried down by the mother to the ground, just as young ducklings are conveyed from a tree-nest to water.

The young chicks, when slightly larger than a Quail, fly well and very strongly; they show their *Galline* nature in displaying a strong affection for the parent. I once shot a hen which was accompanied by a brood of half-grown chicks, and as I approached they ran to and fro by the dead bird until I was close to them, when they flew off.

The figures in the Plate represent a cock from the Trincomalee district, a female from the Horton Plains, and a chick shot on the summit of Allegala Peak.

Genus GALLOPERDIX.

Bill straighter than in *Gallus*, the culmen less curved and flattened at the base; nostrils lateral and elongated, placed in a capacious membrane; the margin of the mandible widened beneath the nostril and suddenly compressed towards the tip. Wings pointed, the primaries acuminate; the 6th quill the longest, and the 1st and 2nd much curved. Tail short, divaricate, and of 14 feathers. Tarsus moderately long and stout, covered in front with pentagonal scales, and armed with long spurs, the number on one leg sometimes exceeding that on the other. Middle toe exceeding considerably the lateral ones, which are subequal.

Head and throat feathered, but the orbits nude. Tail held erect.



GALLOPERDIX BICALCARATA, ♂, ♀

GALLOPERDIX BICALCARATA.

(THE CEYLON SPUR-FOWL.)

(Peculiar to Ceylon.)

Perdix bicalcarata, Forster, Ind. Zool. p. 25, pl. 14 (1781).

Tetrao zeylonensis, Gmel. ed. Syst. Nat. i. p. 759 (1788).

Perdix bicalcaratus, Pennant, Ind. Zool. p. 40, pl. 7 (1790).

Perdix zeylonensis, Lath. Ind. Orn. ii. p. 644 (1790).

Galloperdix zeylonensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 241 (1849); Gould, B. of Asia, pt. vi. (1854); Jerdon, B. of Ind. iii. p. 545 (1864); Hume, Nests and Eggs, iii. p. 555 (1875).

Galloperdix bicalcaratus (Forst.), Kelaart, Prodromus, Cat. p. 131 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 105.

Galloperdix bicalcarata (Forst.), Blyth, Ibis, 1867, p. 308; Holdsw. P. Z. S. 1872, p. 469; Legge, Ibis, 1874, p. 26, et 1875, p. 400; id. J. A. S. (Ceylon Br.) 1874, p. 49; Hume, Str. Feath. 1878, vii. p. 430; id. *t. c.* p. 453.

Das zweigespornte Rebhuhn, Forster, *l. c.*; *Double-Spurred Partridge*, Pennant; *Chittygong Partridge*, Latham (female); *Ceylon Partridge*, Gmelin and Latham; *Spur-fowl*, *Spurred Partridge*, *Kandy Partridge*, Layard.

Haban-kukula, *Saban-kukula*, Sinhalese.

♂ *suprà* niger, plumis medialiter albo lineatis: dorso, uropygio et supracandalibus saturatè castaneis, apicaliter obsoletè nigro angustissimè transfasciatis: scapularibus castaneis nigro vermiculatis, medialiter nigris albo lineatis: tectricibus alarum dorso concoloribus, marginaliter castaneis nigro vermiculatis, majoribus subterminaliter albo maculatis: remigibus brunneis, secundariis extùs castaneo vermiculatis: supracaudalibus longioribus caudàque nigricanti-brunneis: pileo summo nigro, immaculato: collo laterali et corpore subtùs nigris, albo conspicuè flammulatis, hypochondriis longitudinaliter albo notatis: subalaribus nigricantibus: remigibus subtùs pallidè cinerascenscentibus: rostro rubro: plagâ nudâ orbitali rubrà: pedibus rubris: iride brunnescenti-flavâ, interdum rubescente.

Adult male. Length 13.5 to 13.8 inches; wing 6.4 to 6.6; tail 4.0; tarsus 2.0 to 2.1; middle toe and claw 1.6; bill to gape 0.95 to 1.0; spur 0.5 to 0.7, generally two on each leg, sometimes three on one and two on the other.

Iris brownish yellow or brownish red; orbital skin red; bill, legs, and feet red: spurs dusky reddish.

Top of head, hind neck and its sides, interscapular region, lesser wing-coverts, tail, and under tail-coverts black, most intense on the hind neck, slightly pervaded with brownish on the wing-coverts and tail, and blending into the rufous-chestnut of the back, rump, and tertials: head and hind neck striated with white, broadly so on the latter part, and changing into narrow drop-shaped mesial spots on the wing-coverts; lower back and tail-coverts with terminal cross rays of blackish, and the major wing-coverts, tertials, and outer webs of secondaries mottled with the same; primaries brown; face, throat, and under surface white, margined with black: from the chin to centre of fore neck narrowly edged with it, the margin increasing on the lower part of the fore neck, and covering half the feathers on the sides of the same: on the breast the lateral margins are very broad, decreasing at the tip; on the flanks the black increases, leaving a narrow mesial white stripe; thighs and under tail-coverts black, with terminal white spots.

Female. Length 11.75 inches; wing 6.0; tail 3.5; tarsus 2.0; spurs 0.3 to 0.5, one on each leg generally, sometimes two on one leg, and at times wanting on one.

Iris brownish yellow; bill, legs, and feet lighter red than in the male.

Head and hind neck blackish brown, changing into ferruginous on the back and wings, which are finely pencilled with rays of dark brown; head with pale mesial lines; quills brown; outer webs of secondaries mottled with rufous: tail blackish brown; chin and throat albescent, the feathers dark-edged; chest and under surface chestnut, the feathers with pale shafts and dark mottlings, and the fore neck and chest with dark brown lunulations; under tail-coverts blackish brown, mottled with rufous.

Young. In nestling plumage the sexes are alike, and resemble the female adult birds.

Iris brownish red; bill dusky red, with dark tip; legs and feet dusky red; tarsus with blunt tubercles.

Head with fulvous centres to the feathers; upper plumage ferruginous, mottled as in the female; throat whitish.

In some young examples which I kept in confinement the breast was mingled with white feathers. The wing measures during the first year from 5.5 to 6.0 inches.

Obs. This species is distantly allied to the handsome "Painted Spur-fowl" of South India (*G. lunulosus*, Valenciennes), which differs in the spotted character of its plumage and in not having the underparts marked with white. A male example in the national collection measures 5.6 inches in the wing. The head, neck, and back are rich ferruginous chestnut, each feather with a black terminal spot enclosing a white one; scapulars, wing-coverts, and inner tertials deep glossy brown, spotted with white; lesser and median wing-coverts richer chestnut than the back, with greenish-black spots enclosing a white mark; wings ferruginous brown; tail blackish green; chest and breast fulvous buff, with blackish spots; flanks deep chestnut, with black terminal spots, crossed by a black bar.

Galloperdix spadiceus (Gm.), the Red Spur-fowl, is found in the south of India; wing 5.7 inches. The male is brownish chestnut above, with pale edges to the feathers; the female, which is a very handsome bird, is rufous buff above, mottled with brown, and the feathers of the hind neck, back, and wing-coverts handsomely barred with very broad bands of black; fore neck the same; the breast and flanks ferruginous, the breast-feathers with black crescentic tips, and the flanks with mottled bars of blackish brown.

Distribution.—The Spur-fowl is a bird of rather singular distribution in Ceylon, inhabiting the damp jungles of the west and south-west, the forests of the Central Province permanently up to an altitude of 4500 feet about, and those of the southern ranges as well; likewise the Eastern-Province jungles, but not the northern portion of the island. How far northward of the Matale Hills it extends I am unable to say; but I have myself not heard it north of Dambulla, nor on the sea-coast beyond the Virgel. On the western side it is found in the southern portions of the Kurunegala district, straying as far north as Uswewa, and about Ambepussa is not uncommon; further south it increases, and is found in various forest and jungle recesses in the Hewagam and Salpiti Korales. In Saffragam and in the Pasdun Korale it is abundant, and extends in numbers throughout the wooded districts between Galle and the southern hills, in which latter it is likewise common. Eastward of the Kolonna Korale it is rare. I heard it once on the banks of the Kirindeganga in the Wellawe Korale; but higher up, on the slopes of the mountains, it is again common. In the Friars-Hood jungles and about Nilgalla it is plentiful in parts, though not widely distributed as in the damp woods of the western district. It is found more or less in all the jungles of the coffee-districts, and breeds above 5000 feet in some parts; in the cool season it is found in the Nuwara-Eliya district, and very probably extends over all the plateau to the Horton Plains. It is very common in the Knuckles forests.

Habits.—The "Haban-kukula," so well known in Ceylon on account of its remarkable cackling note, is one of the shiest birds in the island, affecting the most entire concealment, and only emerging from the jungles in the early morning. It is so wary that, although it may occasionally be surprised or heard close to a path in the forest, it immediately becomes aware of the presence of the enemy, and runs off with great speed, instantly disappearing in the thick jungle. It does not, however, confine itself entirely to forests, as I have sometimes found it in *Lantana*-scrub and detached copses in the south-west of the island; and I have more than once, by rushing into a small thicket with shouts, endeavoured to get it on the wing, but have always failed, as it invariably escaped by darting through the grass and underwood on foot, and thus gained the main portion of the jungle in safety. On the coffee-estates in the Central Province it comes out of the forest the first thing in the morning, and feeds along the edge of the plantations in silence; almost before the sun is up it retreats into its native fastnesses, and about six or half-past commences to call. There is something highly ventriloquistic in its note; and this, combined with the birds moving about, as I believe they always do when they are calling, makes it impossible to get near them by following the sound of their notes. These are given out and answered by the cocks; and if disturbed during the time they are cackling, they will wait a little, and then recommence louder than ever.

Layard writes as follows on their habits:—"After remaining some time concealed, if nothing occurs to excite their fears, a cock-bird, bolder than the rest, will utter a few low notes, not unlike the plaintive cry of a

turkey poul; if this is answered from a distance, or the birds are reassured by the total silence, the call is changed to a loud piping whistle, of which the following stave gives the nearest representation I can devise:—



and the birds once more sally out from their concealment. I am convinced that, like the Virginian Quail, these birds possess the power of ventriloquism in a great degree. I have often listened to those in my aviary, and could have declared that the calls proceeded from every part of the garden save that in which the performers were located. . . .

"They fly with great rapidity, but prefer to take refuge in concealment rather than maintain a lengthened flight. One which escaped from a basket in my house flew up to the roof and through the ventilating-holes; but instead of continuing on the wing at the elevation it had attained, it dropped instantly into a small copse, out of which it was hunted with much difficulty, when it darted through an open door into my kitchen and concealed itself behind a box.

"The males are very pugilistic, and in their manner of fighting reminded me of the game-cock, depressing and elevating the head, imitating each other's actions, &c."

Though they seem to do well in confinement for a short time, I do not think they would ever live long in a state of captivity, their nature being naturally so wild and shy that they are unable to adapt themselves to the confined life of an aviary. I kept a brood of four, which were brought to me quite young, for eight months, at the end of which time they were stricken with some disease which carried them off one by one. They were at all times very shy, hiding behind the artificial cover with which I provided them, and whenever they were frightened flew up against the bamboo covering of the "run" in which I kept them, sadly lacerating their heads. The injuries thus received, however, did not appear to affect their health, as one individual lived for months with a bare skull, which he acquired by dashing his head repeatedly against the roof of the aviary. They were confined with an old male bird, and did very well for about a month, until they grew up, when they commenced to fight with the cock; and after that they became very shy and restless. When about six months old they began the regular call, uttering it generally about 11 o'clock; but prior to this they made a chirping note, something like that of a young fowl.

Mr. Holdsworth brought some specimens to England, but writes that, "although apparently strong and well, they all died within three days after the ship entered the Thames." This gentleman also states that numbers are trapped by the natives in the upper hills, hair nooses being, I believe, used for this purpose.

Nidification.—The Spur-fowl breeds from April till July or August in the low country, and, I believe, about the same period in the hills. I found a nest on the 17th of July, 1872, on one of the islands in the Ambalangoda Lake; it was situated under an overhanging rock, on stepping on the top of which I flushed the bird from beneath me. She ran a little distance, and then flew off with a loud whirr, like that of a Grouse. It was merely a slight hollow scraped in the ground, with one or two dead leaves on the bottom to serve as a lining; the eggs were two in number, and evidently in this case formed the entire clutch, as they were slightly incubated. I have, however, seen four young in a brood, and Mr. Bligh has met with five. He writes me:—"I once came upon a family of Spur-fowl in large open jungle; the hen flew off at once, warning the brood, which were not larger than Sparrows, with a loud cackling scream, to do the same; they all flew into the bushes and trees. I watched one little fellow fly about 10 yards, and alight on the bole of a large tree some 12 feet from the ground, and cling to a tuft of lichen with which the trunk was covered: so closely did the little bird squat that I had some difficulty in seeing it when I reached the spot; when I disturbed it I was surprised to see it dash away into the jungle with a strong flight, though only a tiny 'chicken.' As old birds most frequently take to thick bushes when disturbed by dogs, from which I have shot them, I expect it is a constant habit of the young to do so too."

The eggs in the nest above mentioned were of a uniform cream-colour, and one of them was covered with small, white, polished, calcareous specks, similar to those often seen on hen's eggs. They were rather broad ovals in shape, and measured 1.42 and 1.43 inch in length by 1.12 and 1.12 inch in breadth respectively.

The figures in the Plate are those of a male and a female from the Southern Province.

GALLINÆ.

Fam. TETRAONIDÆ.

Bill stout, shorter than in Phasianidæ, usually plumed to the base of the nostril. Wings ample, round, but often pointed. Tail usually short. Tarsus short and stout, spurred in some.

Of moderate size, neck short; of stout form; plumage of some differing slightly in the sexes.

Genus FRANCOLINUS.

Bill stout, rather long, wide at the base, culmen curved from the tip; nostrils placed in a capacious membrane. Wings rather short, pointed, the quills acuminate, the 5th quill the longest; secondaries exceeding the primaries. Tail of 14 feathers, longer than in *Perdix*, rounded. Legs and feet stout. Tarsus longer than the middle toe, covered in front with two rows of pentagonal scales. Lateral toes short, the inner less than the outer; hind toe and claw short.

FRANCOLINUS PICTUS.

(THE PAINTED PARTRIDGE.)

Perdix picta, Jard. & Selby, Ill. Orn. pl. 50 (1848-52).

Francolinus pictus (J. & S.), Blyth, Cat. B. Mus. A. S. B. p. 251 (1849); Jerdon, B. of Ind. iii. p. 561 (1864); Blyth, Ibis, 1867, p. 158; Holdsw. P. Z. S. 1872, p. 469; Hume, Nests and Eggs, iii. p. 7 (1875); Butler & Hume, Str. Feath. 1876, p. 7; Fairbank, *t. c.* p. 262; Butler, *ibid.* 1877, p. 211; Ball, *t. c.* p. 419; Davidson & Wender, *ibid.* 1878, vii. p. 87; Ball, *t. c.* p. 225; Hume, *ibid.* List B. of Ind. 1879, p. 111.

The Painted Francolin of some writers; *The Fort-Macdonald Partridge* of the Planters. *Kala-titar*, Hind.; *Kakkera-kodi*, Telugu.

Adult male. Length "12 inches" (Jerdon); wing 5.6 to 5.8; tail 2.5; tarsus 1.6; middle toe and claw 1.35; bill to gape 1.1.

The above measurements are from Indian examples which I have examined.

"Iris dark brown; bill blackish; legs yellow-red" (Jerdon).

(Deesa, Bombay Presidency.) Forehead, face, ear-coverts, and a broad stripe passing from above the eye down to the sides of the nape yellowish rufescent, which colour forms the margins of the feathers beneath the ears and across the hind neck; feathers of the hind neck blackish at the centres, each on the lower part with four round spots opposite one another; prevailing colour of the scapulars and wing-coverts yellowish rufescent, the scapulars with black centres divided by an arrow-shaped mark paler than the edgings; wing-coverts with the rufous portion divided into spots by a blackish central mark; feathers of the back, rump, and upper tail-coverts crossed with alternate black and white bars, tinged on the upper part of the back with fulvous; primaries and secondaries brown, crossed with wide bars of rufescent yellow, which are narrowest on the inner webs; upper tail-coverts iron-grey, barred with combined black and white bars; tail brownish black, barred near the base with white.

General ground-colour of the under surface white, tinged with fulvous on the flanks, abdomen, and throat; fore neck marked with black mesial lines, gradually spreading out on the chest into bars and central marks enclosing round

opposite spots situated near the margins of the webs ; on the breast and lower flauks these markings change into bars ; under tail-coverts dark cinnamon-rufous ; under wing-coverts fulvous, barred with dark brown, greater series light brown.

Female (Wellemade, Ceylon). Length 11.5 to 11.75 inches ; wing 5.3 to 5.7 ; tail 2.9 to 3.1 ; tarsus 1.6 ; middle toe and claw 1.3 ; bill to gape 1.0 to 1.1.

Iris yellow-brown ; bill brownish, the under mandible fleshy, with the tip dusky ; legs and feet yellowish red ; claws dusky.

Lores, face, and ear-coverts tawny rufous, extending high over the eye ; centre of forehead, head, and nape brown, narrowly edged with tawny ; chin and throat buffy white ; centre of the hind neck dark brown, the feathers broadly edged with buff ; lower part of the hind neck with white marginal spots, lengthening out into streaks on the interscapular region ; back blackish brown, crossed with narrow pale wavy marks, which increase in breadth and become white on the tail-coverts ; wing-coverts barred and margined near the tips of the feathers with tawny yellow ; quills not so black as in the male, barred with rufous tawny ; the tertials with spear-shaped cross marks and edges of yellowish buff ; under surface whitish ; fore neck marked with arrow-shaped bars, and the rest of the underparts, except the belly and vent, crossed with broad irregular bands of black, the lower flanks tinged with buff ; abdomen greyish white ; under tail-coverts as in the male.

The female differs from the male in the less conspicuous marking of the hind neck and the interscapular region, and in the somewhat different character of the markings of the chest and fore neck.

Young. Immature birds have the legs and feet duskier than the adult.

The subterminal lateral stripes of the feathers of the back, scapulars, and tertials are paler, and the throat and under surface whiter ; the rufous of the under tail-coverts is not so dark as in the adult, and is barred with black.

Obs. I have not been able to compare a large series of continental birds with my Ceylonese specimens, and therefore I am unable to say whether the differences I have observed in the two races are constant. As regards the males, I am, I regret to say, not in a position to offer any opinion, as all my efforts to procure a male were unsuccessful, and my friends who promised to help me in the matter have not as yet sent me any specimens. The few birds which I shot on two occasions were all females or young birds. Females from India, however, though resembling their insular relatives in most respects, differ in being more rufescent beneath, and the bars on the chest are closer and not so pointed at the centre : the markings on the hind neck resemble more those of the male than in the Ceylon bird, being more in the form of spots than longitudinal bands.

I submitted my specimens to Captain C. H. Marshall, one of our greatest authorities on Indian game-birds, when he was lately in England ; and his opinion was that, though differing in these slight respects, they could not well be specifically separated from the Indian form. A comparison of the males, however, is necessary before we can be certain about the matter ; and should the Ceylon race eventually prove distinct, I would propose for its title the name *watsoni*, after Col. Watson, one of the oldest sportsmen in Ceylon, who was perhaps the first ever to procure the bird.

It appears that this species and the Black Partridge (*F. vulgaris*) interbreed in the north-west of India. Captain Butler describes hybrid specimens, which he obtained in the Deesa district, in the seventh volume of 'Stray Feathers' (1877, p. 211) ; and one of them I have had the opportunity of seeing, owing to the kindness of Captain Marshall. It has the centres of the frontal feathers, a broad line passing from the nostril through the eye and down the sides of the head, the chin, together with the tips of the throat-feathers and the ground-colour of the chest and breast *jet-black* ; the lower hind-neck feathers are jet-black, with the spots quite circular, and the abdomen and vent more rufescent than in *F. pictus*.

The male *F. vulgaris* has the throat, face, neck, chest, breast, and most of the flank-feathers, together with a broad eye-stripe, jet-black ; cheeks and ear-coverts white, and round the neck a collar of chestnut ; back and rump barred black ; under tail-coverts chestnut. The female is not unlike *F. pictus* in general appearance, but has the chestnut collar, whereby it can at once be distinguished.

Distribution.—The Painted Partridge inhabits the patna-hills which form the upland basin lying between the western slopes of the Nuwara-Eliya range and Badulla in the one direction, and the Udu-pusselawa hills and the Haputale range in the other. It is also found about Haputale and Haldamulla, and on the subsidiary patna-hills between Lemastota and Wellaway. Its range, therefore, is extraordinarily restricted, as far as we know at present. In the last-mentioned district Mr. Bligh has observed it ; and it is very probable that it may extend westward into the hilly country which forms the elevated grassy and openly-timbered plateau situated

in the Meda Korale, and which is such a conspicuous piece of country when seen from the Haputale coffee-estates.

It was first made known as a Ceylonese bird by Mr. William Ferguson, who addressed a letter to the 'Observer' newspaper on the 7th of December 1865, calling attention to the existence of a species of Partridge, which he concluded was *F. pictus*, specimens of which had then recently been shot by Mr. Wright in Haputale. This gentleman had met with a flock of six, out of which he procured his birds. A few days after this a second letter appeared in the 'Observer,' from an old sportsman, who affirmed that the same Partridge had been shot in 1848 by Messrs. Poigudestre and Tapp in the same district; and that year would therefore seem to be the earliest date concerning which any published notice of the bird's occurrence was given out. Colonel Watson, of Kandapolla, however, who is one of the oldest sportsmen in Ceylon, informed me that he had shot this bird forty years ago, in the neighbourhood of Fort Macdonald; and, as full reliance may be, I am sure, placed in his identification of the bird, he was, in all probability, the first Englishman who met with it in Ceylon.

On the mainland this Partridge has a tolerably wide range. On reference to the 'Birds of India,' we find the following sketch of its distribution:—"The Painted Partridge may be said to take the place of the Black in Central and part of Southern India. It is found throughout Bundelkund and the Saugor and Nerbudda territories, and thence south through Nagpore and the Deccan, about north latitude 15°, gradually becoming more scarce southwards. I have heard of its occasional occurrence near Bangalore, still further south, but where the land is higher and the climate colder. West it extends into Kandish and perhaps Guzerat, but is not known on the Malabar coast; and eastwards it is found throughout Chota Nagpur and adjacent lands to the more open parts of the northern circars as far as Cuttaek, but far more rare there than on the coast of the peninsula. I have found it most abundant in the Deccan, near Jaulna, and at Mhow, less so in Saugor, Nagpore, and Hyderabad."

As supplementary, and confirming these remarks, we gather from 'Stray Feathers' that the Rev. Dr. Fairbank found it in the Deccan in bushy places; and Messrs. Davidson and Wender state that in this same locality it is common. Mr. Ball met with it on the borders of the Patna and Karial districts, and records it likewise from Raipur, in the Central Provinces. As regards its occurrence in Chota Nagpur, however, he speaks with some doubt, remarking that he has never seen it north of the Mahanadi, and that the only species he met with in the Division was the Black Partridge. With regard to the north-west of India, Captain Butler remarks that it is common on the plains adjacent to Mt. Aboo, but that it does not ascend the hills; and Mr. Hume adds that it is likewise frequent in Kattiawar, and that he has seen it from Anadra, Sirdhi, and Erinpoora, localities in the surrounding district. In 'Nests and Eggs,' this author speaks thus of its range:—"It is found in suitable country in most parts of the northern half of the peninsula of India, extending northwards as far as a line drawn from the Runn of Cutch to Gwalior, and from this latter to Ganjam."

Habits.—This handsome Francolin frequents the low scrub, bushy growth, and maana-grass and braekenthickets which cover the patna-hills stretching from Fort Macdonald across to the lofty Haputale range. This singular tract of country, which I have so often had occasion to refer to in this work, and which I have styled the Uva patna-basin, is one of the most remarkable upland regions in Ceylon. Viewed from the summit of Totapella, which towers, on its south-eastern border, some 3500 feet above the general level of the tract, it has the appearance of a hilly upland plain, bounded on all sides by high mountains. Let us, however, descend through the forests, and cross the Wilson's bungalow and Haputale track, and we find the plain has become transformed into a maze of steep-sided hills, which rise from 400 to 800 feet from the bottoms of the deep gorges, which are drained by a number of streams flowing towards Attampitiya, to form the southern affluents of the Mahawelliganga. These steep "braies," and the high ground between the valleys, are clothed with a tangled mass of scrub, bushes, and lofty maana-tussocks, which, blended together by distance, had the appearance from the top of the mountain of ordinary grass; here and there this vegetation is broken by patches of jungle following the course of the streams, or varied by the presence of green paddy-fields, such as those round Fort Macdonald and Wellemade, and which are the resort of numerous Snipe in the cool season.

Such is the stronghold of the Painted Partridge in Ceylon; and no description of country could be better suited to the skulking habits of this bird. It resorts to hollows and moderate slopes, thickly covered with bushes and grass, and never seems to come into the open except in the early morning or in the evening after

a heavy shower of rain, when the cocks resort to the tops of the white-ants' hills and give out their harsh cry. With a dog they may easily be found, but without it is difficult to flush them. By marking the spots from which the crowing came, I generally found the birds in clumps of grass and bushes, of about 3 feet high or less, out of which I put them by running into them with a shout. They fly straight and with considerable speed, and were, as far as I can judge, usually in pairs. My friend, Mr. Edward Watson, informed me that he had often shot, with the help of a dog, several brace in an afternoon at the same locality (Wellemade) of which I now write. The flesh of this Partridge is good eating, and would, no doubt, be much improved could it be kept as in a cold climate.

Jerdon, who was a keen observer of the habits of Indian game-birds, has the following paragraph on this species :—"It delights in grassy plains and fields, but more affects open, dry, and raised plains with scattered bushes than the low-lying damper meadows that the Black Partridge delights in. It is always when the grain is ripe, as well as at other times not unfrequently, to be found in wheat-fields and other cultivated lands, occasionally in open and grassy glades in the midst of thin forest-jungle. It chiefly occurs in pairs, now and then several, not far from each other. Early in the morning the cock bird may be heard uttering his peculiar guttural call or broken 'erow,' *chee-kee-kerray, chee-kee-kerray*, which can be heard a very long way off, though by no means loud, and is answered on all sides. On approaching the spot whence the sound proceeds, if carefully looked for, he may be seen seated on the stump of a tree or a thick bush, or an ant-hill, or other elevated spot; but when he finds himself discovered, he sinks down and runs off in a way that puzzles dogs much. When the grass is not too high, the Painted Partridge affords very fair shooting with a steady pointer, as also in the wheat-fields in November and December, when the birds have scattered. I have seen this bird perch on a low tree, but very rarely, and only when disturbed by a dog."

I have no doubt that the Uva birds take to the rice-fields in the same way when the grain is ripe. The food of all the specimens I shot consisted entirely of black ants. The cry, as noticed by myself, resembled the syllables *quserk-quserk-quserk*, and was one of the most singularly harsh and grating bird-sounds I have ever heard.

Mr. Blewitt writes that "it is peculiarly active, uttering a low *click, click* while it scratches up the ground for food; or it will roll itself in the dust and nestle on the ground with apparent delight, all the while uttering the low *click, click*."

Nidification.—As I procured immature birds at Wellemade in May, I presume this Partridge breeds during the November and December rains in Uva. According to Mr. Blewitt it breeds at Jhansi in July and September, its nest being placed on the ground in a slight excavation, and under the shelter of a bush or thick patch of grass; it is made of roots of grass and grass itself. The regular number of eggs is seven or eight; and in shape "they are very broad and obtuse at the large end, and much pointed towards the small end." "The colour," writes Mr. Hume, "varies a good deal; some eggs are drabby white, with a faint greenish tinge, others are brownish drab, others cream-colour, and some pale *café au lait*." They are spotless, and measure 1.39 by 1.16 inch.

Genus ORTYGORNIS.

Bill wide and lengthened, the tip well produced over the under mandible. Nostrils basal and oval. Wings rather pointed; the 3rd and 4th quills the longest; tertials equal to the primaries. Tail of 12 feathers, moderately long, slightly exceeding the coverts. Tarsus stout, longer than the middle toe and claw, and armed with a large spur in the male; lateral toes equal.

ORTYGORNIS PONDICERIANA.

(THE GREY PARTRIDGE.)

Tetrao pondicerianus, Gmelin, Syst. Nat. i. p. 760 (1788).

Perdix orientalis, J. E. Gray & Hardw. Ill. Ind. Zool. pl. 56 (1830-32).

Perdix ponticeriana (Gmel.), Blyth, Cat. B. Mus. A. S. B. p. 252 (1849).

Francolinus ponticerianus (Gmel.), Kelaart, Prodromus, Cat. p. 131 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107.

Ortygornis ponticeriana (Gmel.), Jerdon, B. of Ind. iii. p. 568 (1864); Blyth, Ibis, 1867, p. 158; Holdsw. P. Z. S. 1872, p. 469; Blanford, Zool. Persia, p. 273 (1872); Adam, Str. Feath. 1873, p. 392; Ball, ibid. 1874, p. 427, et 1875, p. 209; Hume, Nests and Eggs, iii. p. 542 (1875); Butler & Hume, Str. Feath. 1876, p. 6; Fairbank, t. c. p. 262; Hume, t. c. p. 459; Davidson & Wender, ibid. 1878, vii. p. 87; Ball, t. c. p. 225.

Ortygornis pondicerianus, Hume (List B. of India), Str. Feath. 1879, p. 111.

Francolin à rabat, Temm. Pl. Col. 213; *The Pondicherry Partridge*, Kelaart; *The Red-legged* also *Jaffna Partridge*, Europeans in North of Ceylon. *Titar*, Hind.; *Gora-titar*, of some; *Kawunzu*, Telugu; *Koudari*, Tam. (Jerdon); *Jirufti*, in Persia (Blyth); *Kowthari*, Ceylonese Tamils.

Oussa-watua, Sinhalese.

Adult male. Length 12.0 to 12.3 inches; wing 5.5 to 5.8; tail 3.2 to 3.4; tarsus 1.7 to 1.8; middle toe 1.2; hind toe and claw 0.55; spur 0.6; bill to gape 0.9.

Female. Wing 5.3 to 5.6 inches; tail 3.0; tarsus 1.5.

Iris light hazel; bill, upper mandible dark brown, its edge and the lower mandible flesh-colour; legs and feet dull red; soles greyish, claws brown.

Crown and nape olive-brown; forehead rufous, passing with a paler hue over the eye in a broad supercilium; cheeks and throat concolorous with the eye-stripe; lores whitish; chin and a stripe passing round the rufous gorget white; the latter edged with black across the throat; ear-coverts dark chestnut; general colour of the hind neck, back, rump, and upper tail-coverts greyish brown, crossed with buff dark-margined bands, the grey portions patched with chestnut on the interscapular region and back, but not on the upper tail-coverts; the scapulars and wing-coverts are marked in much the same way as the back, but the rufous-chestnut colour almost entirely overcomes the grey except near the tips of the feathers, and the white bars run along the shaft and are more conspicuously edged with black; primaries and secondaries pale grey-brown, the secondaries and primary-coverts barred with buff, and the primaries with an external margin of the same near the base; tail deep chestnut, with a pale tip and a subterminal patch of black, the two centre feathers greyish brown, crossed with wavy mottled

bands of buff; beneath whitish, washed with rufescent on the chest, each feather crossed with from four to six narrow wavy bars of black, which on the centre of the chest take a crescentic course, and on the flanks become broader; on the upper flanks and sides of the breast there is a chestnut patch along the margins of many of the feathers; under tail-coverts rufous-buff, with narrow wavy bars of black; under wing rufescent white, barred with pale brown.

Females appear to have the bars of the under surface more crescentic than males; but I do not know whether this character is constant, as I did not examine a sufficient number of this sex. The chestnut side-patches are almost absent in immature birds.

Obs. The few examples in the national collection which I have been able to compare with my series from Ceylon are from the north of India, and present some slight points of difference to insular birds. The cross rays of the under surface are not crescentic, as they are on the centre of the breast in Ceylon specimens, but are in the form of *transverse* bars; and in a Kattiawar example there are scarcely any markings on the under tail-coverts, which are almost uniform rufous, with just a trace of barring on the shorter feathers; there is likewise less of the red coloration on the scapulars and wing-coverts. This is, however, a variable character in our insular birds, and is probably the same in continental. Three examples measure 5.4, 5.5, and 5.6 inches in the wing; tarsus 1.6. If my memory serves me aright, caged specimens brought from Tuticorin to Colombo for sale were identical with island birds; and I have no doubt that the species is one which is subject to slight variation in the matter of the marking of the under surface. Some examples I have seen from India have the under tail-coverts quite as much marked as in Ceylonese.

Distribution.—The Grey Partridge is confined to the extreme north of Ceylon and the north-west coast as far south as Puttalam. It extends down the coast as far as Battutoya; but about Chilaw I did not meet with it, and found from inquiry that it did not inhabit that district. It is very numerous on some of the islands off Jaffna, and likewise to the south of Pooneryn Point. In this neighbourhood there is a place called Kowtheri-munoi (Partridge Point), where Mr. W. Murray tells me as many as twenty brace have been shot in the morning before breakfast. All down the coast from this locality to Pomp-aripu it is more or less abundant, and in the Erimativoe Islands I found it plentiful. In Manaar Island it is the same, and beyond our limits in Ramisserum it is equally common. At Aripu Mr. Holdsworth states that it was always very abundant. Mr. Parker informs me that it is very abundant on the coast-plains to the north of Puttalam.

From time to time while in Colombo I met with it in the cinnamon-gardens, in which locality they always frequented one particular spot. These birds, I imagine, had been turned loose, as numbers of Partridges are brought in cages about February from Cochin, Tuticorin, and other South-Indian ports. In 1870 I observed a single bird which frequented some bushes beneath the north front of the Fort at Galle; but this individual had evidently escaped or been turned loose, as I never saw or heard of another in the south of Ceylon.

I am not aware how far south of Elephant Pass this Partridge ranges on the east coast; but I believe it has been met with to the north of Mullaitivu. It does not extend inland in any part of the island.

It is found, according to Jerdon, throughout the greater part of India, not frequenting mountainous or forest districts, and totally wanting throughout the Malabar coast. Though recorded from Nepal by Hodgson, it is rarely met with, says the author of the 'Birds of India,' north of the Ganges; but I imagine it is found on the plains of Oude and other level districts, eschewing, as Mr. Hume remarks ('Nests and Eggs'), the humid tracts of Lower Bengal, and the Dhoons and Terai that skirt the bases of the Himalayas. Mr. Ball records it from the Rajmehal hills, Manbhum, Hazaribagh, and Lohardugga, and remarks that it is rare in the extreme west of Chota Nagpur; he likewise found it in the higher valleys of the Suliman Hills. Thence northwards it probably extends into Afghanistan, as it ranges as far as Persia, throughout the south-eastern portion of which country Mr. Blanford found it. Its extreme western limit, writes Major St. John, in Persia appears to be Lar. It is also common in Baluchistan.

Returning, however, to the Indian Empire, with which we have more particularly to deal, we find it common in open and cultivated districts throughout the entire north-western region, although, according to Captain Butler, it occurs sparingly in the hills. Further south in the Deccan it is, according to the Rev. Dr. Fairbank, universally distributed, and is likewise said to be common by Messrs. Davidson and Wender. In the eastern

portions of the Carnatic it is, of course, common, and extends up to the bases of the mountain-ranges, if we may judge by Dr. Fairbairn finding it at Peria Kulam at an elevation of 900 feet.

Habits.—In Ceylon this Partridge confines itself to the sea-coast, and there almost entirely affects open ground studded with low bushes and clumps of stunted jungle. Its habit is to frequent the vicinity of cover, and when alarmed to either run or fly into the nearest bushes and underwood, often perching on a branch at no little height from the ground. It is extremely noisy, commencing its loud call at daybreak and invariably renewing it, after its midday interim, about 4 o'clock. While cruising off or sailing down the north-west coast, the traveller may hear its far-sounding notes along the whole shore-line, continued until dusk. These resemble the syllables *ke-āugh-ke-āugh* repeated several times, and are varied by a more lively call like *ka-tēē klar-ka*, *ka-tēē klar-ka*, which may be heard at a long distance off. Mr. Simpson tells me that the male and female unite their notes and cry in consort. In the Jaffna district numbers of these Partridges are caught by the natives with hair nooses and kept for sale; many likewise find their way in native vessels to Colombo from Tuticorin, as many as half a dozen being confined in a small circular basket without any apparent inconvenience to themselves. Small covies associate together, but do not seem to keep close company, as when they take flight they are usually flushed singly and the birds get up at some little distance from one another. They prefer, however, to seek safety by using their legs, and are very swift runners; when they take to cover, they are sometimes difficult to flush, moving away entirely without the sportsman's knowledge, especially if he be unaccompanied by a dog. Jerdon testifies to the difficulty of flushing them, and says that they run with amazing speed, taking refuge in thick bushes and hedges. He writes as follows:—"When flushed it rises with a loud whirr, flies very strongly, but does not take long flights. It frequently perches on low trees and shrubs and on the branches of thick *Euphorbia*-hedges. Its call is a peculiar loud shrieking, and has not unaptly been compared to the words *patula-patula-patula*, quickly repeated, but preceded by a single note uttered two or three times, each time with a higher intonation, till it gets, as it were, the key-note of its call."

A writer in the 'Bengal Sporting Review' says that the young, which soon get strong on the wing, "attempt to call when only five days old."

I have found its food to consist of ants and grass-seeds; and Jerdon says that it is very partial to small grasshoppers.

Concerning its nature this writer remarks as follows:—"It is easily tamed, and may be brought to follow its owner about like a dog, even through a crowded street. It is very commonly kept by Mussulmans in small cages, sometimes for fighting, as it is highly pugnacious and fights with great spirit and obstinacy. Partridges with double spurs are esteemed the most for fighting. It will readily utter its call when spoken to, and is generally liberated on a grass plain for a run every morning, returning to its cage when called upon. It is also used as a decoy for wild birds, a tame bird being put down near an aviary and made to call, when he is invariably met by a cock-bird and a battle ensues. The bird-catcher approaches and seizes the wild bird as it is heedlessly engaged in the fight."

Several authors testify to its partial avian habits. Mr. Holdsworth noticed that it roosted in low bushes at Aripu; and Mr. Ball has known it to perch on trees at 20 feet above the ground and call from that elevated position.

Nidification.—Layard observes that this Partridge breeds twice a year, in August and December, laying from eight to sixteen eggs, measuring 15 lines (1.26 inch) by 12 lines (1.0); they are laid, he says, in a hollow at the bottom of a bush or tuft of grass, with little or no nest. The breeding-season, however, is continued later than December, for I have met with a young brood in the middle of March. Two eggs received by me from the Puttalam district were pale buff or very light stone-yellow, one having a few very faded lilac-coloured blotches at the small end. They are pyriform in shape, and measure 1.4 and 1.38 inch in length by 1.03 and 1.04 inch in breadth respectively.

In India it lays from February to June and from September to November, in all of which months Mr. Hume remarks that he has taken its eggs. "The nest is usually placed," writes this gentleman, "on the ground, under some large clod in a ploughed field, under a bush, or in a tuft of grass, but is sometimes fixed

in the lower branches of some dense thorny shrub as much as 3 feet from the ground." It is more or less neatly lined with grass, and the usual number of eggs varies from six to eight.

It is well known how close Partridges will sit on their eggs; and the "Grey" of India does not seem to be any exception to this rule. Mr. A. Anderson has the following anecdote relative to this habit:—"When out coursing on the *chur* lands opposite the station of Futtchgurh I flushed a 'Grey' which was feeding in an open field! It struck me at once that this was the male, and that the female must be feeding somewhere, because these birds invariably go in pairs, and this was their breeding-season. Forming a line with my coolies I beat every conceivable bit of cover (there was not a crop standing for miles), including a few clumps of *sarpat* grass which grew in the form of a hedge. I rode alongside of this grass hedge (it had been charred) and looking down into the centre of each clump soon discovered what at first appeared to be a hare in her *form*, but which on closer inspection proved to be the hen Partridge. The grass was again well beaten, and, as a last resort, handfuls of earth and small stones were showered in on her from above, but without avail. Seeing how futile were all my efforts to flush the Partridge, I decided on capturing her in her nest, which was effected by my horse-clothing being placed over the clump and the coolies making a rattling noise round the bottom of the grass, which eventually had the effect of making her rise perpendicularly. The nest was carefully fenced in with grass-stalks of the thickness of an ordinary cane, so that ingress and egress for so big a bird must have been a matter of no little difficulty."

Genus PERDICULA.

Bill short, very high at the base, the culmen curved from the forehead. Wings short and rounded, the primaries sinuated on the outer webs; the 3rd and 4th quills the longest; the 1st quill slightly variable in length; secondaries exceeding the primaries. Tail short, of 12 feathers. Tarsus stout, covered before and behind with broad scales, and armed with a blunt tubercle. Toes long, the lateral ones nearly equal.

Of small size. Sexes differing in plumage. Feathers of the chest rigid.

PERDICULA ASIATICA.
(THE JUNGLE BUSH-QUAIL.)

Perdix asiaticus, Latham, Ind. Orn. ii. p. 649 (1790).

Coturnix pentah, Sykes, Trans. Zool. Soc. ii. p. 19, pl. iii. (1835).

Perdicula cambayensis (Lath.), Jerdon, B. of Ind. iii. p. 581 (1864); Blyth, Ibis, 1867, p. 160; Beavan, Ibis, 1868, p. 386; Ball, Str. Feath. 1874, p. 427; Hume, Nests and Eggs, iii. p. 546 (1875); Fairbank, Str. Feath. 1876, p. 262.

Perdicula argoondah (Sykes), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107.

Perdicula asiatica, Gould, B. of Asia, pt. 15, pls. xii., xiii. (1863); Holdsw. P. Z. S. 1872, p. 470; Davidson and Wender, Str. Feath. 1878, vii. p. 87; Hume, *t. c.* p. 158; Ball, *t. c.* p. 225.

Perdrix rousse-gorge, Temm. Pl. Col. 447; *Spurred Quail* in India. *Juhar*, *Auriconnai* (Beavan) in Manbhum; *Girza*, Hind.; *Girza-pitta*, Telugu (Jerdon).

Adult male and female. Length 6.5 to 6.7 inches; wing 3.0 to 3.25; tail 1.3 to 1.5; tarsus 1.0 to 1.1; middle toe and claw 0.95 to 1.05; bill to gape 0.5, height at nostril 0.25.

Iris brownish red or dark red-brown; bill dark horn; lower mandible bluish, with dusky tip; legs and feet dark yellow-red; claws tipped with dusky.

Top of the head dark brown, paling on the occiput, hind neck, and upper surface into cinereous brown, and bounded by a conspicuous white stripe passing from the bill over to the nape; between this stripe and the eye a supercilium, below the eye a short stripe, and the chin and throat dark rufous; hind neck and upper back with buff mesial lines, and crossed with heavy pencillings of black; lower back and rump crossed with black-edged wavy buff barrings; scapulars, tertials, and wing-coverts marked with bold fulvous-yellow mesial stripes and the inner webs with large black patches and rufescent crossings; quills brown, barred with yellowish rufescent, chiefly on the outer webs; tail crossed with narrow alternate wavy bars of rufescent yellow and black; cheeks white, with black edgings; lower fore neck, chest, and sides of breast white, with bold black bars, blending into pale rufous on the lower flanks, abdomen, and under tail-coverts, the centre of the breast being rufescent whitish.

Female. Iris paler red than that of the male; bill somewhat paler; legs and feet yellowish red.

Rufous supercilium larger than the male, continued upon the forehead and back to the end of the white stripe; throat more intense rufous, this colour frequently joining the rufous spot beneath the eye; striae on the hind neck faint; mesial stripes on the scapulars, tertials, and wing-coverts less bold and handsome, but the black and rufous-yellow markings similar; fore neck and its sides and entire under surface *uniform rufescent isabelline*, paling down the centre of the breast, and pervaded with a greyish hue on the chest.

Young. Iris pale brown; bill reddish brown at the base, becoming duskier at the tip; legs and feet pale yellowish.

In nestling plumage the *male* has the upper surface much as in the adult, but the stripes on the back much broader; the head-feathers edged pale; the white stripe above the eyes very broad; the red supercilium, cheeks, and throat wanting; the whole under surface is cinereous rufescent, brightest on the flanks and under tail-coverts, and the feathers of the throat, fore neck, and chest with white mesial lines, which extend partly down the flanks as well; on the chest there are indications of black bars; a slight wash of rufous on the chin; the cheeks whitish, striated with dark brown. At a further stage the rufous on the chin and throat increases slightly, and the fore neck and chest begin to assume dark bars, edged with rufous; these increase in intensity with age, and are found mingled with the still-remaining rufous feathers on the chest, the flanks being at this time very faintly barred.

Obs. The stripes on the back of the male evidently decrease with age; but it does not follow that the youngest birds have them the most pronounced; for a specimen before me with scarcely any rufous on the chin or trace of barring on the chest is marked with narrower striae, both on the back and scapulars, than another, considerably more advanced, on the chest and throat.

I am again at a disadvantage in having no South-Indian specimens for comparison with my Ceylonese series. Judging from results obtained by comparing North-Indian and insular birds, I should say that the latter almost constituted a darker race, the only specimen that I have seen approaching them as to depth of colouring being a male labelled Behar in the British Museum. It measures 3·2 inches in the wing, and is nearly as dark above as my Eastern-Province skins; but there is more rufous on the forehead; the throat is as dark as the latter, but the thighs and under tail-coverts are darker ferruginous. A male from Futtehghurh, collected by Mr. Anderson, is altogether a paler bird, for, in addition to the back being a pale grey-brown without a trace of mesial stripes, the rufous eye-stripe and throat, and the barring of the chest, together with the black scapular-patches and the central stripes, are very much lighter in colour; and the bars, which are much closer than in my skins, are continued down to the belly instead of the lower breast, beneath which part the Ceylon bird is only marked with transverse pencillings. The same rufous feature on the forehead is observable that I have noticed in the Behar skin; and this is caused by the eye-stripe being much broader at its commencement near the nostril, and thus uniting across the forehead. Captain Beavan gives the measurements of specimens shot at Morar as follows:—Length 6·0 to 6·5 inches; wing 3·0 to 3·12; tail 1·5 to 1·75; tarsus 0·87 to 0·93; bill from gape 0·5.

I have not had the advantage of seeing any females from the continent, and therefore cannot speak on any points of difference in their case.

Perdicula argyronotus, the Roek Bush-Quail, is recognized by the front of the crown and forehead being rufous, by the feathers at the end of the rufous cap on the top of the head being tipped with black, and by the absence of stripes on the scapulars and back; there is a white stripe immediately over the eye and also above the red stripe, as in *P. asiatica*; the throat and face are pale sienna reddish. The upper surface is characterized by the barring of the feathers; but examples from various parts of India appear to vary in their markings. Two males from Futtehghurh are very handsomely clouded with black and rich buff on the back, scapulars, and tertials, which coloration on the hind neck takes the form of bars. Another from Ahmedabad has but little of the black marking, the ground-colour dappled grey and black, with whitish-buff bars on the hind neck and back; the fore neck and breast are white, closely barred with black, as in *P. asiatica*.

I have followed Messrs. Gray and Hume in applying Latham's name to the present species, and not to the Roek Bush-Quail, as did Jerdon. Latham's description, to which I have referred, appears to apply sufficiently well.

Distribution.—Layard first recorded the existence of what we may conclude was this species in Ceylon. He speaks of it in his notes as follows:—"I have only seen one pair of these elegant little Partridges; they were caught alive at Cotta, near Colombo. I have an egg, which can only belong to this bird, also found in the same locality." That the Jungle Bush-Quail should occur in the Western Province is a matter of surprise to the author, for it is a species which belongs to the dry districts of the island, and has never been heard of, to my knowledge, on the south-western side by any one, except on the occasion in question. It inhabits the grassy jungles in the Park country, and those of the Wégam and Medagam Patuwas, which constitute the extensive district lying along the base of the Madulsima ranges. I found it very numerous in the months of August and September between Kalōday and Bibile on the new Batticaloa road. I am not aware for certain how far it extends towards the Hambautota district, but I believe it is found not far from Yāla. I did not see it in the Wellaway Korale, nor in the neighbourhood of Kattregama. It is probably a bird of local distribution, confining itself to strips and tracts of country throughout the Eastern Province, whose grassy glades are combined with clumps of open forest, and not passing beyond barriers of heavy jungle; in support of which belief I may mention that it seems to be shut in by the belt of forest lying between Kalōday and the Maha-oya, to the eastward of which I saw no trace of it. It was not met with anywhere above 1000 feet elevation.

Jerdon writes:—"This pretty little Bush-Quail is extensively distributed throughout India, and is found at all levels, from the sea-coast up to nearly 5000 feet of elevation. In the south of India it is chiefly found in the more wooded districts in Malabar, Mysore, on the Eastern Ghâts, and on the various hill-ranges, being rare in the low Carnatic and bare land. Col. Sykes found it on the higher ranges of the Western Ghâts at 4000 feet, and it is found throughout Central India as far as the northern slopes of the Rajmehar, Monghyr, and Mirzapore hills. It is not generally found on the north bank of the Ganges; but Hodgson cites it as found in the sub-Himalayan zone." Mr. Hume enumerates the localities whence he has obtained it as "Simla, the Dhoon, Umballa, Mount Aboo, Anadra, at the foot of Aboo; Etawah, Mirzapore; Seoni, Central Provinces; Nursingpore, Raipur, valley of the Tapti, West Kandeish, Mahabaleshwar; Kelsi, Bankok, and other localities in the Southern Korkan; Madras and Pothanore." Captain Beavan records it as tolerably abundant in

Manbhūm; and Mr. Ball has procured it in other parts of Chota Nagpur and in the Satpura hills. It is found at Khandala and Mahabaleshwar, according to the Rev. Dr. Fairbank; and by Messrs. Davidson and Wender it is recorded as common in the hills at Satara and Nulwar.

Habits.—The Jungle Bush-Quail associates in moderately-sized covies, and affects grassy tracts and glades in the midst of forest; it keeps usually to long grass, where it obtains suitable cover, but in search of food will come out in roads and pathways; and while thus feeding I found that it exhibited a remarkably fearless disposition. During a trip to the Eastern Provinces in 1875 I first met with it, and at the outset became acquainted with it by finding small covies scratching by the road-sides after heavy showers of rain; they were searching for grain among the straw and litter left by natives at their nightly camps: on several occasions they took flight in little detachments of two or three; and when these were fired at their companions did not rise, but either ran into the adjoining grass or continued on the road. Such extraordinary tameness on the part of game-birds I had never previously witnessed; and when I even fired (with a view of getting as many specimens as possible) into a covey they did not rise, but quietly ran to the side of the road. Elsewhere I found them on the sandy bed of a dried-up river, similarly occupied in picking up the grain at a native camping-place. Their flight is straight and strong, but not long continued, for, when they appear to be “well on the wing,” they suddenly drop to earth, after the manner of other Quails. While flying they gave vent to a chirping note, which was answered by those which were still on the ground.

Jerdon thus speaks of this Quail:—“Riding through some of the more open forests, especially in the upland districts, a bevy of this little bird is often seen crossing the road, or feeding on grain dropped by cattle. In the North-west Provinces, however, they appear to frequent gardens, bushes, and hedgerows in more open ground near stations. . . . It is found in covies or bevs of from six to eight to a dozen and more; and generally all rise at once with a loud whirring noise, uttering loud cries of alarm, and after a short flight drop down again into the jungle.” Blyth notices that it has a peculiar quivering whistle, which it utters continuously.

Nidification.—Immature birds procured by me in the Eastern Province in September appeared to be about five or six months old, so that the breeding-season is probably about March or April. The egg which Layard alludes to measured 12 lines (1·0 inch) by 9 lines (0·76 inch).

Concerning its breeding in India, we gather the following from Mr. Hume’s ‘Nests and Eggs.’ He writes:—“The Rock Bush-Quail, the only species whose eggs I have myself taken, lays at any time from August to December, and again in March, and, for all I know, may lay straight on all the year through, but I have myself taken nests in all the months mentioned. I think they have two broods in the year, but cannot be certain; anyhow, March and September are the months in which I have found most eggs.

“They always prefer semi-waste strips of land covered with high grass, and in the neighbourhood of cultivation, for nesting. The nest is slight, composed of grass loosely wound round into a circular shape, and is placed generally, but not always, in a depression, scratched for it by the birds, at the foot of some tuft of grass or under some thick bush. Six or seven is the usual number of eggs laid.”

The eggs are described as moderately broad ovals, somewhat pointed towards the small end; they are “white, glossy, and spotless, tinged (but far less deeply than in the Grey Partridge) with *café-au-lait* colour.” Average dimensions 1·02 by 0·84 inch.

Genus COTURNIX.

Bill slender, slightly curved from the base; the nasal membrane partly feathered. Wings longer than in *Perdicula*; the 1st and 2nd quill, or the 2nd, the longest. Tail lax, very short, concealed entirely by the coverts. Legs and feet moderately stout; the outer toe joined by a web at the base to the middle.

COTURNIX CHINENSIS*.

(THE CHINESE QUAIL.)

Coturnix philippensis, Brisson, Orn. i. p. 454, pl. 25. fig. 1.

Tetrao chinensis, Linn. Syst. Nat. i. p. 277. no. 19 (1766), ex Edwards.

Tetrao manillensis, Gmel. ed. Syst. Nat. i. p. 764 (1788), ♀.

Coturnix excalfactoria, Temm. Pig. et Gall. iii. pp. 515, 742 (1815).

Coturnix flavipes, Blyth, J. A. S. B. 1842, xi. p. 808, ♀.

Synoicus? chinensis, Gould, B. of Austr. vol. v. p. 92 (1848).

Coturnix chinensis, Blyth, Cat. B. Mus. A. S. B. p. 255 (1849); Layard & Kelaart, Cat. B. Appendix, Prodrusus, p. 60 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107; Sclater, P. Z. S. 1863, p. 221.

Excalfactoria chinensis, Jerdon, B. of Ind. iii. p. 591 (1864); Gould, B. of Asia, pt. 17 (1867); Beavan, Ibis, 1868, p. 386; Swinh. P. Z. S. 1871, p. 401; Holdsw. P. Z. S. 1872, p. 470; Ball, Str. Feath. 1874, p. 428; Legge, Ibis, 1874, p. 26; Salvadori, Ucc. di Born. p. 311 (1874); Walden, Tr. Zool. Soc. 1875, p. 224; Hume, Nests and Eggs, iii. p. 553 (1875); Oates, Str. Feath. 1875, p. 345; Hume, ibid. 1878, vii. p. 226, et 1879 (List Malay B.), p. 69; id. t. c. (List Ind. B.) p. 111.

Excalfactoria australis, Gould, Handb. B. of Austr. ii. p. 197 (1865).

Excalfactoria sinensis, Hume, Str. Feath. 1878 (B. of Tenass.), p. 447.

Chinese Quail, Edwards, Illust. v. p. 77, pl. 247, ♂; *La Caille des Philippines*, Brisson; *Blue-breasted Quail*, *Painted Quail*, *Rain-Quail*, *Swamp-Quail*, of Sportsmen. *Pikau*, Malay; *Chaun-chan*, China; *Pipit-kan*, Borneo (Mottley).

Pandura-watuwa, *Wenella-watuwa*, Sinhalese.

Adult male. Length 5.2 to 5.7 inches; wing 2.5 to 2.9; tail 0.9; tarsus 0.8 to 0.9; middle toe and claw 0.8 to 0.85; bill to gape 0.45.

Iris crimson or deep red; bill blackish leaden, bluish at the base, in some with the culmen only bluish; legs and feet rich yellow; claws olive-brown.

Old bird (Galle). Crown, hind neck, back, and scapulars olive-brown, with a bluish cast on the back, and tinged with rusty in parts, chiefly on the occiput, interscapular region, and back; on the occiput and nape the feathers have

* This species has been placed by Bonaparte in a separate genus, *Excalfactoria*, based on the difference of plumage in the sexes and the slightly rounder wing. The latter is a variable character as regards some of the species restricted to *Coturnix*. The bill, legs, and feet in the present bird are those of a true Quail, and I therefore do not adopt Bonaparte's genus.

small marginal spots of black ; on the interscapular region are bars of the same chiefly confined to a web, and on the lower back and scapulars there are bold blotches and markings of a like colour, with a whitish-buff mesial stripe to each feather, vanishing by degrees towards the hind neck ; on the occiput there is an indication of a light streak formed by the pale colour of the basal parts of the feathers ; quills, lesser wing-coverts, and primary-coverts uniform brown ; tertials mottled with black at the tips ; median and greater wing-coverts, with the outer webs and the margins of the inner, ferruginous chestnut ; the centre of the feathers washed with slate-blue ; upper tail-coverts (which entirely conceal the tail) slate-blue in the centre, and deep ferruginous chestnut at the sides ; some of the central feathers mottled with black.

Chin, throat, and part of the cheeks black, enclosing a white pear-shaped patch on the face ; below the black gorget there is a wide crescentic band of white across the throat, running up to, and narrowing to a point at, the ear-coverts ; this is bounded beneath by a black border ; through the lores a white stripe ; forehead, passing over the eye and down the sides of the neck, chest, sides of breast, and upper flanks fine slate-blue, like the centre of the upper tail-coverts ; centre of the chest, breast, abdomen, under tail-coverts, and tail deep ferruginous chestnut or fine chestnut-maroon ; concealed feathers down the centre of the breast whitish ; under wing-coverts pale greyish.

Another example, equally old apparently, from Borella, has the white stripes on the lower back more indistinct, and those on the upper part of the interscapular region plainer ; the latter part is more marked with black, as are also the tertials ; there is much less chestnut on the chest, the blue colour monopolizing most of that part and descending much upon the flanks.

Immature males have the stripe on the occiput plainly indicated ; the hind neck, back, and rump boldly striated with white, no bluish tinge on the back, and less of the chestnut-maroon on the wing-coverts ; in some the latter characteristic is almost wanting.

Female. Smaller. Length 5·0 to 5·2 inches ; wing 2·6 to 2·8.

Iris yellowish red, in some dusky red ; bill dark leaden ; legs and feet paler yellow than in the male.

COTURNIX COMMUNIS.

(THE COMMON QUAIL.)

Coturnix communis, Bonnaterre, Tab. Encycl. Méth. p. 217 (1790) ; Blyth, Cat. B. Mus. A. S. B. p. 254 (1849) ; Jerdon, B. of Ind. iii. p. 586 (1864) ; Hume, Nests and Eggs, iii. p. 549 (1875) ; id. Str. Feath. 1879 (List B. of Ind.), p. 111 ; Dresser, B. of Eur. pt. 69, 70 (1878).

Batter, Ghagaz *batter*, Hind. ; *Peria kadeh*, Tamil (Jerdon) ; *Budinah*, *Watwalek*, in Turkestan (Scully) ; *Summin*, Moorish ; *Codorniz*, Spanish (Irby) ; *Kwartel*, Dutch.

Adult male and female (England). Length 7·50 inches ; wing 4·2 ; tail 1·4 ; tarsus 1·1 ; middle toe 0·9 ; bill to gape 0·61.

Iris yellowish brown ; bill dark brown ; legs fleshy yellow.

Male (summer). General colour of the upper surface rusty brown ; the feathers of the crown, hind neck, back, rump, and tail marked with black, mostly on the crown and rump ; on the crown the feathers are tipped with fulvous, and on the hind neck, back, and tail centred with very broad rufescent-buff stripes, and the black lateral portions pencilled with rufous, which rather predominates on the interscapular region ; throat, upper fore neck, a broad eye-stripe, and another narrower one over the crown buffy white ; cheeks and ear-coverts dark brown, mottled with rufous, and from the latter two curved stripes descend towards the centre of the throat, the lower passing across it in a band of a darker colour ; wing-coverts and quills brown, the coverts striped and barred with buff, and the quills indented on the outer webs with the same ; beneath fulvous, tinged strongly with rufous on the chest and upper breast ; the flank-feathers with broad lateral black stripes, edged with rufous ; chin spotted with brown ; sides of the chest striped with blackish brown.

Plumage wanting the blue and maroon colours. General character of the upper surface ferruginous brown, handsomely blotched on the back and rump with black, and also cross-rayed with the same; the crown is chiefly black, the feathers edged with rufous-brown; down the centre is a conspicuous whitish stripe, tinged with rufescent in some, and the feathers of the upper surface, together with those of the scapulars, some of the tertials, and innermost greater wing-coverts, have a bold pale central stripe, most conspicuous on the rump.

Forehead, above the eye, face, chin, and throat *pale* rufous-brown, with a black-dotted stripe from the gape to the ear-coverts, which are greyish; chest, upper breast, and flanks barred with black on a light rufescent ground, which pales to whitish, unmarked on the lower breast and abdomen; thighs and under tail-coverts barred with black.

Birds which are apparently immature are characterized by the rufescent character of the striae and ground-colour of the under surface. In some the chin is almost white.

Obs. I regret to say that I did not succeed in procuring any nestlings of this species; and I am therefore unable to supply those details as to young plumage and subsequent changes which I find wanting in previous descriptions of this interesting and variable little bird. It is, I think, not unreasonable to conjecture that the male and female are alike in the first stage.

An examination of a series from India, China, the Philippines, the Malay Archipelago, and Australia will demonstrate that this Quail is subject to much *local* variation, chiefly consisting in the greater or less amount of blue on the wings and back of the male, as also in the extent to which the black markings of the back monopolize that part, which latter characteristic must be looked for chiefly in the male. The absence or not of the occipital stripe, and the amount of striation on the back and of red on the wing, I take to be caused by age as much in birds from other parts as I have found to be the case in Ceylon, with this reservation, that in India the stripe on the head seems to be normally more pronounced than in birds from other parts. Birds which I take to be not fully-aged males from China ("Takow" and "China") agree, however, with some from India in having the stripe much pronounced.

Sarawak, Malaccan, and South-Australian examples (males) are characterized by a large amount of blue on the upper surface, and the females by having the lower back much overspread with black, and seem, at first sight, to be quite different birds; but on closer examination the coloration is merely an exaggeration of what exists in our birds.

Female. Wing 4.3 to 4.4 inches. Has the chest less tinged with rufous than the male, and the stripes on the side of the neck and the throat-band absent; the former are present as a series of spots only.

Young. The chick is rufous-buff above, with two broad black stripes over the head and one down the back, and an irregular stripe along the back at each side; wings striped with black.

Distribution.—Mr. Bligh, my valued correspondent from the Central Province, writes to me of the supposed occurrence, in the Yāla district, of the Common Quail. In January (1879) last he met with a pair of large Quails which were flushed from beneath his feet, and flew away strongly, uttering a chirping note similar to that of the species in question; but being in pursuit of large game at the time, he was unfortunately (for science at least) unable to fire, and he does not therefore consider his identification satisfactory. In point of fact these birds may have been the little Quail-Partridge, *Perdicula asiatica*, already treated of, or they may have been the Rain-Quail of India, *C. coromandelica*, which was included, on what authority we know not, in Kelaart's catalogue. The former is common in the Eastern Province, and the latter may have, on equal grounds with the Common Quail, journeyed southwards to Ceylon during the migratory season. Both are, however, only slightly smaller than the Bush-Quail (*Turnix taigoor*), which Mr. Bligh well knows, and numbers of which he met with on the trip in question about Yāla; whereas he writes me that these new birds were much in excess of that species. It is therefore not unlikely that, after all, his surmise may be correct, and doubtless on some future occasion the Common Quail will be satisfactorily identified from Ceylon.

It is a cold-weather visitant to India, being found throughout the empire in suitable localities during the winter months; but many pairs are said to remain to breed in the northern parts of the country. It does not appear to pass to the east of the Bay of Bengal, although it is an inhabitant of China in winter and summer, and a resident, according to Swinhoe, in Formosa. To these eastern regions of the continent, however, it finds its way from Southern Siberia, across which it extends in summer from Western Asia, reaching even the distant islands of Japan. In elevated regions on the

Mr. Gould separated the Australian species in his 'Handbook' as distinct, bestowing on it the title of *Excalfactoria australis*, on the ground of it being smaller. I do not find this to be the case, and as regards plumage it is not separable from Malayan-archipelago skins. The following are measurements of various examples:—♂ (S. Australia), wing 2·7 inches; ♂ (Ceylon), wing 2·7; ♂'s (China), wing 2·7 and 2·9; ♂ (Sarawak), wing 2·9; ♂ (Penang), wing 2·7; ♀ (Ceylon), wing 2·6; ♀ (Nepal), wing 2·8; ♀ (South Australia), wing 2·6. It will be seen from these data that there is not that difference in size which would warrant a specific separation.

Females from China appear to have the under surface more rufous than Ceylonese.

C. minima, Gould, from Celebes, is, as its name implies, a very diminutive variety of the present. It differs also as regards plumage.

Distribution.—This beautiful species is found chiefly in the well-watered low-country districts of the west of the island, ranging into the hills to some considerable elevation, where it affects the paddy-fields cultivated on the terraced sides of the Kandyan valleys. It is a permanent resident in the cinnamon-gardens near Colombo, inhabiting the "water"-grass-fields and the damp fern-covered hollows near the watercourses which here and there intersect that once extensive plantation. In the south of Ceylon I have found them tolerably frequent in paddy-fields and grass cultivation near Galle, where Layard, as well as at Matara, observed it to be common. He likewise saw it in the Pasdun Korale. In the valley of Dumbura it is not uncommon, and I have known it to occur in paddy-fields high up in Hewahette (3500 feet). It is found about the borders of some of the tanks in the northern half of the island, affecting the grass-lands which surround these sheets of water. I noticed it particularly near Mincriy, and I have no doubt it frequents many such situations.

On the mainland its distribution is easterly. It does not inhabit the north-western parts of India at all, but ranges through Bengal into Assam and Burmah, and thence southwards down the Malay peninsula, and eastwards to Chiua. Jerdon writes:—"I have killed it only in the Caruatic; one specimen is recorded in my Catalogue from Belgaum in Western India. It occurs occasionally in Central India, and in the upper provinces as far as Bareilly; but it is rare in all these localities, and perhaps only stragglers find their way so far. In Lower Bengal it is tolerably abundant in damp grassy meadows, the edges of indigo-fields, and in the grass on the roadsides; and in Burmah it was, in the month of July, the only Quail I observed." Following up these remarks I find that it has not been met with by recent naturalists in the Deccan, and that little is said in 'Stray Feathers' about its occurrence anywhere in India. Mr. Ball remarks that it occurs rarely in Chota Nagpur; and Mr. Hume records it from Raipur only as regards that part of India. In the British Museum there is a specimen from Nepal. On the eastern side of the Bay of Bengal it becomes

northern confines of India it is resident; for, according to Dr. Scully, it is a permanent inhabitant of the plains of Kasgharia, and in these regions it has been obtained by Dr. Henderson as high as 13,500 feet at the Karatag lake. In the northern and south-western districts of Turkestan, Severtzoff states that it is resident up to 1000 feet. In Persia, writes Mr. Blanford, it is common in the summer, leaving there for India in the cold season.

It is an inhabitant of all Europe as far north as Archangel, and is tolerably common in Great Britain, extending in the breeding-season to the north of Scotland and also of Ireland. Throughout the continent of Africa it ranges as far as the extreme south, extending into Madagascar, whence Professor Newton has received it, and it has been obtained even in the island of Mauritius. It is, however, principally a winter bird in Africa, migrating, according to Captain Shelley, through Egypt on its way to Europe in March, and returning again in November. Layard states that they arrive in South Africa in August, some making their appearance as early as the 15th. The Atlantic islands are also included by this wandering little bird in its travels; for it is found in Madeira and the Canary Islands, and likewise in the Cape de Verdes and Azores.

Habits.—Concerning the Quail's habits in India (with which I merely have to do in such a curt notice as this) we read in Jerdon that it is there "found in long grass, corn-fields, stubble, and fields of pulse, wandering about according as the crops ripen in different parts of the country. . . . In parts of Bengal they abound to such an extent that seventy-

commoner. Mr. Oates writes of it:—"The Blue-breasted Quail is common in many parts of the Pegu plains. I first met with it in June, and throughout the rains it continues to be common. I am inclined to think that it comes to Lower Pegu at the beginning of the rains, and leaves as soon as the business of breeding is over." In Tenasserim it is sparingly distributed throughout the province according to Mr. Hume. In the Malay Peninsula, further south than Tenasserim, and connecting this province with the Malay islands, it must needs be found; and in Mr. Hume's List of Birds of that region it is recorded from Malacca and Nealys. It is likewise found in Penang, whence I have seen a specimen sent by Dr. Cantor. From Sumatra it was recorded by Raffles, and from Java by Horsfield; and in Borneo it has been obtained in Banjermassing by Mottley, in Sarawak by Mr. H. Everett, and in Labuan by Governor Ussher. Northward it extends to the Philippines, from which islands it was first made known, and where it is common in Negros; and thence it ranges to Formosa, and on the mainland it inhabits South China, being also found in the island of Hainan.

What islands form the connecting link between Java and Borneo and Australia I am unable to say; but this little Quail is evidently found on some of their intervening chain, and thus extends into the great island continent. There it is found, according to Gould, in "nearly every locality. In some seasons," he writes, "it is very numerous in such low and humid districts as are clothed with dense and luxuriant grasses and other vegetable productions." It is not uncommon in South Australia, and I have seen it myself in Victoria not far from Melbourne.

Habits.—This little bird loves damp spots, and thus frequents low-lying grassy hollows in open jungle, paddy- and watergrass-fields, moist fern-brakes, &c. It associates in small coveys, and is not difficult to flush, though when on the wing it does not fly far. Its flight is straight but not strong, and it takes but little hitting to bring it down. In the south of Ceylon, where it is more numerous than elsewhere, it affords fair shooting, particularly in uncultivated paddy-lands, where it is sure to be found among rank herbage.

In the cinnamon-gardens of Colombo, where it is not uncommon, it affects the fields of water-grass grown in the damp hollows by natives for horse food; and in the evening I used to find it feeding in the stubble on portions which had been cut: when flushed it would fly off into the tall standing grass and was difficult to find again without a dog; I am under the impression, however, that they do not run like many game-birds, but lie very close after alighting, refusing to rise unless almost trodden upon. It is, as a rule, most silent, but occasionally it will utter a low *cheep, cheep*, when put up; and this I noticed particularly in the case of a bird which I appeared to have wounded with "dust" shot on first firing at it.

It thrives in confinement, like other Quail, but requires a roomy aviary to dwell in. Jerdon says little concerning its habits; but he remarks that when the young are full-grown they disperse all over the

five brace have been killed by two guns." The same writer remarks that they are netted in great numbers in some parts of the country, and many are also caught in hair nooses. The Nepalese have an ingenious way of catching Quail. They put a pair of imitation horns on their heads and walk slowly about the stubble-fields, twisting some blades of grass in their hands in a way to imitate the champing of grass by cattle; and as these birds are not alarmed by cattle, they succeed in driving any Quail they see under a small net, which they then drop and secure the bird. Its note during the breeding-season is likened by Col. Irby to the syllables *quit que-twit*.

Nidification.—In India the Quail that remain to breed lay in March and April. Mr. Hume describes a nest which he found in the Purneah district as "a shallow saucer-like depression scratched by the bird and lined with a few blades of dry grass. It was placed in a tuft of grass and dwarf *Zizyphus* on a ridge separating two millet-fields. The nest contained nine eggs absolutely in the act of hatching off; we caught," he writes "the female on the nest, examined the eggs, found the point of the bills protruding in two, so put them gently back and put the mother on the top, where she sat winking at us, but never attempted to leave the nest."

The eggs, which are broad pointed ovals, are "clear yellowish or reddish buff, and they are thickly speckled and freckled, or more thinly spotted or blotched, with deep reddish brown, or at times bluish black. The average of nine eggs is 1.16 by 0.91 inch."

country; and this dispersion is greatly assisted, and in many parts perhaps caused, by the heavy inundations to which a great part of the country of Bengal is annually subjected. Mr. Mottley thus describes its habits in Borneo. "After having been once flushed," he remarks, "these Quails fly a short distance and are difficult to raise again, running with great rapidity among the grass."

Nidification.—In the Colombo district the Chinese Quail breeds in May, in which month I shot a specimen with an egg in the oviduct almost ready for expulsion; it was of a clear pale green colour devoid of any markings, although it might perhaps have acquired colouring-matter afterwards. I am unable to give any reliable information concerning the nesting of this bird, as but little is known about either its nest or eggs, and the data which do exist supply rather conflicting evidence. Jerdon describes the eggs as pale green; and this bears out my own experience. Mr. Hume furnishes but scanty information in his useful work 'Nests and Eggs,' referring only to a single egg which he received from Captain Hutton, and which is described as a "broad oval in shape, much compressed and pointed towards the small end, and with a slight pyriform tendency. The ground-colour is dingy greenish white, thinly speckled here and there with reddish brown. Dimensions 1.0 by 0.78 inch."

Again, my correspondent Mr. MacVicar, of the Ceylon Public Works Department, informs me of a nest, which he considers he satisfactorily identified, situated on the bund or embankment at the edge of a paddy-field near Kæsbawa; it was made of grass and built in a hollow in the ground. The number of eggs was seven, and in shape they were rather broad ovals, of a clear olive-colour, stippled throughout with dull brownish specks. The dimensions of one I measured were 1.0 by 0.96 inch.

Finally we have a note of an egg supposed to belong to this species in Lord Walden and Mr. Edgar Layard's paper on the birds of Negros ('Ibis,' 1872, p. 106), and which is as follows:—"A single egg of a Quail we suppose to belong to this species. Mr. L. Layard describes the bird as not uncommon. The egg is of a darkish brown generally, but irregularly speckled and blotched with very dark madder-brown specks and blotches of various sizes: axis 12 lines (1.0 inch); diameter 9 lines (0.76)." It will be observed that the size in the various accounts is about the same; and this goes far to prove that the eggs have severally been correctly identified, although they vary in colour. It is probable that Jerdon was misinformed as to the exact character of the egg, and thus omitted mention of any markings; whilst in the case of the one I extracted from a specimen the coloration was not yet complete.

GALLINÆ.

Fam. TINAMIDÆ.

Bill longer than in the last family, straight at the base, compressed at the tip; nostrils linear. Wings short. Tail very short, wanting in some genera; upper tail-coverts lengthened, concealing the tail in many. Tarsus moderately lengthened, without spurs. Hind toe usually wanting, in some very small.

Sternum with a deep emargination next to the keel, and the outer notch wanting.

Genus TURNIX.

Bill rather long, compressed, straight at the base, the tip well curved; gonys-angle pronounced. Wings moderate; the quills curved, the 1st, 2nd, and 3rd quills the longest. Tail very short, lax, of 10 or 12 feathers. Tarsus lengthened, much exceeding the middle toe, protected in front with rectangular scales; hind toe wanting; middle toe much longer than the lateral ones; claws stout.

Female in some species larger than the male and more handsomely coloured.

TURNIX TAIGOR.

(THE BLACK-BREASTED BUSTARD-QUAIL.)

Hemipodius taigoor, Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 155 (the male); id. Trans. Zool. Soc. ii. p. 23, pl. iv. (1841).

Hemipodius pugnax, Sykes, *ut suprâ*, p. 155 (the female).

Turnix ocellatus (Scop.), Blyth, Cat. B. Mus. A. S. B. (rufous var. from South India and Ceylon), p. 256 (1849).

Turnix sylkesi, A. Smith.—I once met with a flock or bevy of small Quail among the long grass in tolerably open jungle near Kottiar, but did not procure a specimen. It is possible they may have been the above species; but, on the other hand, there is a small Button-Quail of India (*Turnix sylkesi*) with which they may have been identical. I therefore subjoin Jerdon's description of this bird:—"Head brown, black-barred, with a pale supercilium and central stripe; upper parts chestnut-brown, each feather finely barred with black and edged with yellowish white, conspicuously on the scapulars and part of the back, and on the wing-coverts so broadly as to appear entirely yellowish white, with chestnut black-edged spots: quills dusky brown; rump and upper tail-coverts dark brown, closely barred with black, and with faint whitish edges to the feathers; throat whitish, with open blackish specks on the sides; breast pale ferruginous, with the sides of the neck and breast with dark brown drops and lunules; abdomen whitish; bill plumbeous; irides pale yellow; legs fleshy whitish. Length 5 to 5 $\frac{1}{4}$ inches, wing 2 $\frac{3}{4}$, tarsus $\frac{3}{4}$

"Occurs throughout the whole of India (not, however, affecting hilly or forest districts) in grass, corn-fields, and wherever there is thick herbage. It is flushed with great difficulty, often getting up at your very feet, flies but a few yards, and drops down again into grass, not to be refushed but after a most laborious search, and sometimes allowing itself to be caught by the hand or by a dog."

? *Coturnix coromandelica*, Kelaart, Prodrumus, Cat. p. 131 (1851, nec Gmelin).

Turnix ocellatus (Scop., var. *taigoor*, Sykes), *apud* Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107.

Turnix taigoor (Sykes), Jerdon, B. of Ind. iii. p. 595 (1864); Blyth, Ibis, 1867, p. 161 (in part); Beavan, Ibis, 1868, p. 386; Holdsw. P. Z. S. 1872, p. 470; Ball, Str. Feath. 1874, p. 428; Legge, Ibis, 1874, p. 26, et 1875, p. 400; Butler & Hume, Str. Feath. 1876, p. 7; Fairbank, *t. c.* p. 62; Butler, *ibid.* 1877, p. 231; Davidson & Wender, *ibid.* 1878, vii. p. 87; Ball, *t. c.* p. 226; Hume, *ibid.* 1879 (List Ind. B.), p. 111.

Turnix pugnax, Hume, Nests and Eggs, iii. p. 553 (1875); *id.* Str. Feath. 1875, p. 178; Fairbank, *ibid.* 1877, p. 409.

? *The Indian Quail*, Kelaart; *The Button-Quail*, *Bush-Quail*, *Black Quail*, of Sportsmen. *Gulu* and *Gundlu*, Hind. in the south; *Salui gundru*, Hind. in N.W. Provinces; *Puredi*, lit. "the bold one" (female); *Koladu*, lit. "no spirit" (male), Telugu; *Kurung-kadeh* (female), *An-kadeh* (male), Tamil (Jerdon); *Kādai*, Ceylonese Tamils.

Watuwa, *Panduru-watuwa*, *Bola-watuwa*, Sinhalese.

Adult male. Length 5·8 to 6·0 inches; wing 3·0 to 3·1; tail 0·8 to 1·0; tarsus 0·95; middle toe and claw 0·8; bill to gape 0·67.

Iris white; bill light leaden, dusky brown on culmen; legs and feet pale bluish or fleshy grey, with the joints and tarsus washed with bluish.

Head and upper surface rufous, with a brownish wash on the former; the feathers of the crown with whitish tips, those on the hind neck with white bars, edged with black; back, scapulars, and tertials with wavy cross bars and pencillings of black, many of the back-feathers and the scapulars with broad lateral white stripes; wing-coverts with broad buff-white bands and bars of black; quills brown, the outer primaries with yellowish-white edges, and the secondaries with indentations of the same on the outer webs; throat, fore neck, and chest white, more or less tinged with buff, narrowly barred on the chin and throat and broadly barred on the chest with black; breast, belly, and under tail-coverts light rufous, palest on the abdomen.

Female. Length 6·3 to 6·5 inches; wing 3·4 to 3·55; tarsus 1·0; middle toe and claw 0·82; bill to gape 0·7.

Iris white, in some with a yellowish hue.

Head browner than in the male, with black spots and bars anterior to the white tips; back more handsomely barred with black, and with the longitudinal buff stripes bolder; wing-coverts and outer webs of the tertials with more of the buff-white ground, and very boldly barred with black; secondaries blackish brown except at the tips, which are pale; tertials rufous, marked with black and buff on the outer webs; chin, throat, and down the centre of the fore neck and chest *uniform black*; sides of the chest with broader black bars than the male; lower parts deeper rufous.

Young. Birds of the year are not so conspicuously marked as adults; the females have the throat barred with black, and the males indistinctly marked with the same; abdomen and under tail-coverts pale rufescent.

Obs. As on the mainland, so in Ceylon this species is subject to considerable variation in plumage. Specimens from the south and from the damp portions of the west of the island have the rufous of the underparts much deeper than north-country birds, which latter correspond tolerably with examples from India. Two skins in the national collection from India have the abdomen and under tail-coverts pale yellowish ferruginous, and the middle of the breast *fulvescent*; and these, I apprehend (for I have not had the advantage of looking over a large series), represent the extreme pale coloration in this species. They measure in the wing 3·3 and 3·4 inches, and are both females.

Two species are at present recognized in India as belonging to this type of Bustard-Quail—the present and the allied Malaccan, Burmese, and Himalayan form, *T. plumbeipes*, Hodgson, *apud* Hume. This latter is, in fact, the species styled by Jerdon "The Hill Bustard-Quail," which he places under the head of *T. ocellatus*, Scopoli, and which follows his article on the present species in the 'Birds of India.' They are closely allied, and, according to Mr. Hume,

do not differ materially in size, nor can be separated safely on the ground of difference in *marking*. He writes, however (Str. Feath. vol. vi. p. 451), that "in *T. plumbeipes* the prevailing tint of the interscapular region and back is brown; in *T. taigoor* the prevailing tint of these parts is rufous, and this difference extends more or less to the head and the whole of the upper plumage." The rufous tints of the under surface are subject to the same variation.

The oldest title applied to the Black-breasted Bustard-Quail was that of Temminck, *T. pugnax*, Pl. Col.; but the species he described was said by him to inhabit Java, and may have been *T. plumbeipes*, the eastern ally of *T. taigoor*. As Sykes, therefore, properly discriminated the peninsular Indian form under the last-named title, it has been adopted by recent ornithologists as more definite than Temminck's original name.

Distribution.—This Bustard-Quail is scattered over most of the open country in Ceylon, being more numerous in some localities than in others. In the maritime districts of the Western Province, including the sea-board from Manaar southwards to Chilaw, and in suitable localities round the south-west coast, it is perhaps more common than elsewhere. Again, in portions of the Eastern Province where the ground is sandy and covered with low bushes it is numerous, as in the Yāla district, where, Mr. Bligh writes me, it was abundant; and in the northern parts of the low country it is found in old clearings overgrown with grass and shrubs, and also on open bushy land on the borders of tanks. Mr. Holdsworth remarks on its occurrence at Aripu; and northward of that place along the coast to the Jaffna peninsula (in which latter district Layard says that it is abundant) it is also found. In the neighbourhood of Trincomalee I met with it frequently in grassy places near village tanks and in jungle-clearings. It is common in the cinnamon-gardens of Negombo, Colombo, and Morotuwa, and breeds even in public resorts, such as the "Circular," &c., where there are bushes to afford it the necessary cover.

To what elevation it ranges into the Kandyan zone I am unable to say; but I have not myself met with it in any high-lying patnas. It is, I believe, found on the Dumbura upland.

On the mainland it inhabits suitable localities throughout the peninsula of India, extending westwards to Cutch, where Dr. Stoliczka procured it, and in the opposite direction as far as Eastern Bengal, in which district its Malayan ally, *T. plumbeipes*, replaces it; but beyond which, in Cachar and in the upper portions of Burmah, according to Mr. Hume, it is again found, though not as commonly as the latter species. In the Manbhūm division of Chota Nagpur it was procured by Captain Beavan; and Mr. Ball records it besides from Lohardugga, Bilaspur, Nowagarh, and Karial, while Mr. Hume notes it from Raipur. In the Deccan it is said to be sparingly scattered throughout; and by the Rev. Dr. Fairbank it is recorded as common in the Khandala district; he likewise observed it in grain-fields near the base of the Palani hills. As regards the north-west, Captain Butler remarks that it is not common and does not ascend the Abou hills; and Mr. Hume observes that he has not heard of it from Sindh, Jodhpoor, or Kattiawar.

Habits.—The Black-breasted Bustard-Quail is an inhabitant of open scrub, long grass dotted with bushes, the outskirts of low jungle, cinnamon-plantations, and such-like situations where cover is combined with grass and rank vegetation. It is rarely found in damp spots like the last species, and, in fact, is especially partial to sandy soil, which is the driest ground to be had anywhere in the maritime regions of Ceylon. It is only when accompanied by their young brood that these birds are found in coveys; they are generally met with singly, or two at some little distance from each other; they lie close, and when they rise either fly straight back over your shoulder, or dart like an arrow round the nearest bush, suddenly alighting again when out of reach of danger. At times they are very difficult to flush without a dog, as the bird runs in and out among bushes, and dodges backwards and forwards and in and out among the grass and shrubs, most of the time visible to the sportsman, who is eagerly waiting for it to rise. Some of the Bustard-Quails, and particularly the present species, are remarkable for the Amazonian disposition of the females, which, being larger and more handsomely plumaged than their partners, exhibit, during the breeding-season particularly, the bold and combative propensities which usually characterize the males. The hen birds attract each other by uttering their note, which Jerdon aptly styles a "purring call;" and when a *rencontre* takes place they at once engage in combat. So intent are they in carrying on the battle that I have stopped my carriage within a few yards of a pair fighting by the roadside in the "cinnamon," and watched them for some time without their taking any notice of me!

Jerdon has the following paragraph on the habits of the females and the advantage taken of them by the native bird-catchers. He writes :—"The hen birds are most pugnacious, especially about the breeding-season; and this propensity is made use of, in the south of India, to effect their capture. For this purpose a small cage with a decoy-bird is used, having a concealed spring-compartment, made to fall by the snapping of a thread placed between the bars of the cage. It is set on the ground in some thick cover, carefully protected. The decoy-bird begins her loud purring call, which can be heard a long way off; and any females within ear-shot run rapidly to the spot, and commence fighting with the cage-bird, striking at the bars. This soon breaks the thread, the spring-cover falls, ringing a small bell at the same time, by which the owner, who remains concealed near at hand, is warned of a capture, and he runs up, secures his prey, and sets the cage again in another locality. In this way I have known twelve to twenty birds occasionally captured in one day in a patch of thick bushy jungle in the Carnatic, where alone I have known this practice carried on. The birds that are caught in this way are all females, and in most cases are birds laying eggs at the time; for I have frequently known instances of some eight or ten of those captured so far advanced in the process as to lay their eggs in the bag in which they are carried before the bird-catcher had reached my house."

They fight like the common hen, stretching up their heads and trying to circumvent each other, pecking out vigorously all the while. When undisturbed they have a low "grunting" note, which they continue to utter while running about in cover. Their diet consists chiefly of seeds; but I have always found insects in the stomachs of specimens I have examined. The larvæ of grasshoppers is included by Jerdon among their food; and he rightly remarks that their flesh is excellent, being succulent and tasty. When "walking" up these Quail without a dog the females are usually flushed, and one rarely succeeds in putting up a male.

Nidification.—In the south of Ceylon, as well as in the north-west, this Quail lays from February till May, and most likely has another brood later in the year. The nest is placed in a depression scraped in the ground under the shelter of a tussock or bush, and is made of grass and dry leaves loosely put together, but forming rather a bulky structure, with a deep hollow in the middle. The eggs vary from two to four in number, and are very large, particularly as regards diameter, for the size of the bird. Some are much pointed at the small end, others are more in the shape of pointed ovals, but always very broad. The ground-colour is dull greyish white, thickly freckled all over with dark brown, over which there are largish spots of blackish scattered here and there; in others there are inky-grey blotches and large blotches of black, whilst in some the very dark markings are entirely wanting. They measure from 0·90 to 0·98 inch in length by from 0·69 to 0·75 inch in breadth.

I have found the male sitting on the eggs; and Captain Butler relates catching a male bird in a hair noose he set by a nest; so that the habit of the female to depute her partner to assist in the duties of incubation would appear general.

In India this species lays from June to September, according to locality, commencing earlier in the south than in the Carnatic. Mr. Hume remarks :—"Sometimes it makes no nest at all, and merely scratches a hollow at the base of, or in the midst of, some tuft of Sirpatta grass, or occasionally some little dense bush adjoining or surrounded by long grass. Sometimes it makes a little pad of grass 3 or at the most 4 inches in diameter and half an inch in thickness, which it places as a lining to the hollow." Jerdon tells us that the females are said by the natives of India to desert the eggs, and that the males hatch them. Judging by the details already referred to on this head, it would seem probable that this assertion is correct. Mr. Hume characterizes the stippling on the surface of the eggs as a "mixture of minute dots of yellowish and reddish brown and pale purple." The average size of thirty eggs, according to him, is 0·93 by 0·79 inch.

Order GRALLÆ.

Bill varied, but usually straight, in many long and slender. Wings proportionately long. Tail in general short, the feathers varying much in number. Legs lengthened and slender, with the *tibia bare**; anterior toes often connected by a partial web, sometimes only between the middle and outer toe; hind toe in general small and raised, in a few long and on the same plane as the front; in some absent altogether.

Fam. RALLIDÆ.

Bill in general rather short (in some lengthened), much *compressed*, high at the base, straight, with the nostrils median and pierced through the mandible; culmen in many produced back upon the forehead in a casque. Wings rounded, with a tubercle at the flexure; the tertials lengthened. Tail of 10 to 12 feathers, very short, scarcely exceeding the closed wings. Legs more or less lengthened. Tarsus moderately stout, covered in front with broad transverse scales. Feet large. Toes lengthened, exceeding the tarsus in some; hind toe well developed, rather long in some.

Sternum narrow, the keel high, and with a very deep notch on each side of it.

Mostly of skulking and aquatic habits, and with the power of swimming well.

Genus PORZANA†.

Bill rather short, much compressed, straight, slightly depressed at the centre of the culmen; nostrils linear, and placed in a lengthened depression; gonys pronounced. Wings slightly rounded, the 3rd and 4th quills the longest, and the 1st shorter than the innermost; a small tubercle at the flexure. Tail longer than the tarsus, rounded, the feathers lax; bare portion of tibia less than the hind toe and claw. Tarsus equal to the middle toe, covered with broad but smooth scales. Toes smooth; outer toe longer than the inner; claws acute.

Of small size.

* The Woodcock forms an exception.

† I commence the Grallæ with this genus of the Rallidæ, as it grades more than any other into the Quails, and exhibits slight affinities with the Gallinaceous birds. The pretty little subgenus *Coturnicops*, of which Mr. Swinhoe's little Chinese Crane (*C. exquisita*) is a member, have much the form and aspect of game-birds.

PORZANA BAILLONI

(BAILLON'S CRAKE.)

Rallus bailloni, Vieill. Nouv. Dict. xxviii. p. 548 (1819).

Crex pygmæa, Naum. Vög. Deutsch. ix. p. 567, pl. 239 (1838).

Zapornia bailloni (Vieill.), Gould, B. of Europe, p. 344 (1837).

Porzana pygmæa (Naum.), Blyth, Cat. B. Mus. A. S. B. p. 284 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 723 (1864); Schlegel, Mus. Pays-Bas, *Ralli*, p. 30 (1865); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 476; Hume, Lahore to Yarkand, p. 293 (1873); Walden, Trans. Zool. Soc. ix. p. 230 (1875); Howard Irby, B. of Gibraltar, p. 143 (1875); Scully, Str. Feath. 1876, p. 193; Blanford, Str. Feath. 1877, p. 247.

Ortygometra pygmæa (Naum.), Gray, Gen. B. iii. p. 593; Gurney, Ibis, 1865, p. 273; Shelley, B. of Egypt, p. 275 (1872); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1236 (1874); Hume, Str. Feath. 1874, p. 301.

Zapornia pygmæa (Naum.), Hume, Nests and Eggs, iii. p. 603 (1875); Butler, Str. Feath. 1877, p. 215.

Porzana bailloni (Vieill.), Davison & Hume, Str. F. 1878 (B. of Ten.), p. 467; Ball, *ibid.* vii. p. 229; Dresser, B. Eur. pt. 65, 66 (1878); Hume, Str. F. 1879 (List B. Ind.), p. 113.

Pygmy Rail, *Pygmy Crake* of some authors. *Pollos de Agua*, Spanish (Saunders); *Polluela*, Spanish (Irby); *Himi-kuina*, Japanese (Blakiston and Pryer); *Tsing-tsuy*, lit. "Green bill," Chinese (Swinhoe).

Adult male and female. Length 7·0 to 7·4 inches; wing 3·5 to 3·8; tail 1·3 to 1·6; tarsus 1·1; middle toe 1·3; bill to gape 0·78 to 0·8.

These measurements are taken from a series of Ceylon, Chinese, Bornean, and European examples.

Dr. Scully gives the following measurements of a Yarkand example:—Length 7·3 inches; wing 3·6; tarsus 1·1; bill from gape 0·85.

Captain Shelley's measurements are:—Length 6·5 inches; wing 4·0; tarsus 1·1; culmen 0·7.

Iris red; bill, upper mandible dark green, lower paler; legs and feet olive-greenish, toes slightly dusky, claws brown. "Bill dull sap-green" (Everett, MS.). Bill brownish olive-green (Colombo, Dec. 1876).

Male (Bintulu, Borneo: winter). General colour of hind neck, back, wing-coverts, and tail yellowish olive-green, the feathers of the head, hind neck, back, and scapulars with black centres, and those of the back and scapulars with broad margins of white on one web, which is likewise mottled with black; on the wing-coverts and tertials there are oblique white bars surrounded by black edges; primaries and secondaries brown, edged with olive; a broad slate-coloured stripe above the eye; face grey, tinged with slaty; lores and a stripe above the eye and the sides of the neck rusty olivaceous; immediately in front of the eye a blackish spot; throat whitish, blending into the pale slaty of the fore neck and chest; sides of the breast rusty olive, changing to blackish on the lower flanks, abdomen, and under tail-coverts, all of which parts are barred with white; under wing-coverts brownish, barred with white; edge of 1st primary white.

An example procured in Ceylon in 1876 corresponds with the above; the chin and gorge are whitish, blending into the surrounding slaty bluish of the sides of the throat, chest, and upper breast.

These examples are probably not mature, owing to the white on the chin.

Adult (Holland). Throat, fore neck, and whole face with the ear-coverts slaty bluish; no white on the chin; lower parts blacker than in the above. A *Shanghai* example has the slaty colour of the neck and chest bluer than in the Bornean bird; the chin is whitish.

Young (nestling). "Covered with black down; bill white; feet reddish white." (*Dresser*.)

Immature. "Differs from the adult in lacking all trace of blue; the sides of the head are warm ochreous brown, the chin and upper throat pure white; lower throat, breast, and upper flanks dull brownish ochreous; centre of the abdomen white; flanks and under tail-coverts black, barred with white; upper parts as in the adult, but scarcely so clearly marked." (*Dresser*.)

Obs. Allied to this species is *P. parva*, Scop., which is found in parts of India (Sindh, &c.). It may be distinguished, writes Mr. Hume, by having the white markings on the upper surface, which are broader and of a somewhat purer white than in *bailloni*, "confined, as a rule, to the centre of the back, though occasionally some of the longer scapulars are faintly edged with bluish white."

The wing varies from 3.75 to 4.1 inches, and the bill at point from 0.7 to 0.76 inch, according to the same authority.

Distribution.—This little Crane has proved itself to be an occasional straggler to Ceylon, visiting the island in the cold season at the time when, in other parts of the world, it is acted upon by a migratory impulse and moves southwards.

Two instances of its occurrence are all that are known to me: the first was made known by Layard, who writes (*loc. cit.*), "a single specimen was brought to me alive from Kotte;" the second, which came under my personal notice, was that of an individual which was caught on the 22nd of December, 1876, in the compound of Mr. Haly, the Director of the Colombo Museum. It was evidently a new arrival, and the date of its discovery shows that it was a very late visitor of the season. It is highly probable that others came with it; and in future years examples will, no doubt, from time to time, fall into the hands of collectors.

Baillon's Crane enjoys a vast range, occurring throughout Europe, except in the extreme north, takes in the whole of Africa, more or less, into its wanderings, extending across to the island of Madagascar, spreads across Southern and Central Asia to the Philippines, and thence through the Malay islands to Australia.

It is found throughout India in suitable places, but it does not seem to be common in the south. The Rev. Dr. Fairbank records it from Ahmednagar; but Messrs. Davidson and Wender did not meet with it in the Deccan. Further north Mr. Ball notes it from Sambalpur on the north of the Mahanadi, from Nowagarh and Karial, and from the Rajmehar hills. Mr. Hume records it from Raipur, and notices that it is sometimes obtained near Calcutta and brought into the market for sale; he likewise notes it from Dacca and Tipperah.

Westward it is found at Etawah (breeding there), also near Delhi; and at Syree, near Simla, which has an altitude of about 4000 feet, it is common. In Cashmir it breeds, and is doubtless plentiful in suitable localities. In Sindh it appears to be very rare, being replaced there by *P. parva*, Scop.; but Mr. Blanford instances a specimen which was obtained at the Manchar Lake. Mr. Adam also records it once from the Sambhur district in Rajputana. I do not find it spoken of by Mr. Oates in Pegu; and in Tenasserim it appears to be rare, as Mr. Davison only saw it at Tavoy. Concerning its distribution in the Indo-Chinese region, we have not much data; it probably occurs in winter in Siam and Cochin China, and likewise perhaps in summer, for Swinhoe records it as inhabiting China throughout in the latter season. It extends northwards to Japan, but does not appear to be common there, Messrs. Blakiston and Pryer only instancing one example in their catalogue, which was procured at Yezo. It visits Borneo in the winter, Mr. Everett having obtained a specimen at Silai in the Bintulu district, which has been described above, and which, according to Mr. Sharpe, is the first that has ever been met with in that island. It appears to have occurred in the Philippines, as there is a specimen in the Leyden Museum procured there by M. Verreaux.

Returning to the confines of India, we find Severtzoff stating that it occurs on passage in Turkestan, and likewise breeds in the north-western and south-eastern districts at altitudes up to 3000 feet. At Yarkand Dr. Scully remarks that it is not at all common, but that probably some individuals breed there. In Palestine Canon Tristram met with it; and it is said to breed in the Caspian district. It visits the northern shores of the Mediterranean in April, later than which Dr. Giglioli notices that it arrives in the Pisa district. In Sardinia Mr. Brooke says that it is of rare occurrence; and in Hungary it is likewise uncommon. In the south of Spain it is chiefly a winter resident, as Col. Irby says it is very common from October till February, being met with while snipe-shooting. He also obtained it in May at the Laguna de Janda, and states that

many remain to breed in April. Lord Lilford found it nesting near Seville; and Mr. Saunders likewise states that it breeds in that neighbourhood, recording it also as common on the Sigüera river. It extends into Central Europe, and ranges as far north as Great Britain and Holland. It has bred in Great Britain, two nests having been taken in Cambridgeshire in 1859; but it has, nevertheless, not extended to Ireland.

In Morocco and Eastern Tangier, Mr. Tyrwhitt Drake observes that Baillon's Crake is rare; and Mons. Favier, as cited by Col. Irby, makes a similar remark. As an Egyptian bird Captain Shelley gives it a place in his book solely on the evidence of Rüppell, who states also that it occurs in Arabia. Mr. Gurney, jun., obtained it at Laghouat in Algeria; and Von Heuglin met with it frequently in the Fayoom, generally in pairs and at the beginning of May, from which he infers that it probably breeds there. Hartlaub records it from Madagascar; and in South Africa it is far from rare. Mr. Ayres met with it in the Transvaal in January and April, and says it is common in Natal at Maritzburg; while in Damara Land, on the opposite coast, Mr. Andersson observed it frequently. Finally it has been recorded from Madeira.

Habits.—Like most of the smaller Rails, this little bird affects concealment to such an extent that it is difficult to flush it, unless it is suddenly frightened up while shooting Snipe or other Waders, or put on the wing by a dog. It frequents small sedgy watercourses, marshes, and overgrown swamps. Mr. Hume says that in India it may be "at times mistaken for a Quail. It is of much the same size, looks on the wing of much the same colour, and takes short flights over the rushes, and drops suddenly just like a Quail."

Mr. Davison writes that at Tavoy "a few frequented some canals overgrown with rank grass and wild pine-apple. They were very difficult to obtain, as it was almost impossible to flush them from the cover in which they lodged." Col. Irby also states that, owing to their skulking propensities, they are seldom obtained in Spain.

Von Heuglin noticed it principally frequenting tamarisk-scrub growing in shallow water; in the day-time it was shy, rising on his approach, and taking refuge among the roots of thick and tangled vegetation, from which it was difficult to drive it. In the mornings and evenings, however, it was to be seen moving about in more open places, and now and then giving vent to its piping cry. He found its diet to consist of worms, larvæ, flies, and small snails.

Mr. Ayres's experience of it is as follows:—"It inhabits the swamps and rushy pools, creeping amongst the weeds and grass on the edges in search of food; when disturbed it flies but a few yards, and drops suddenly into the weeds almost before the gun can be got to the shoulder, and is therefore not very easy to shoot. The morning is the best time to look for these birds."

Nidification.—The Pygmy Rail breeds in the plains of Upper India in July and August, and, according to Mr. Hume, in June and July in Kashmir and the valleys of the lower ranges of the Himalayas. A nest taken by Messrs. Brooks and Hume at Etawah "was of rush and weed in the midst of grass and wild rice, very little above the water's surface." It is often quite concealed by the surrounding grass. At Syree a similar nest to the above was found, containing six eggs, which appear to be the usual number.

The eggs are described as being oval, pointed towards one end; of a pale olive stone-colour, freckled and mottled with faint dusky clouds and streaks, most densely set towards the large end. They vary in length from 1.1 to 1.12 by from 0.83 to 0.91 inch in breadth. Col. Howard Irby writes that they make a small nest, in Spain, of sedges and grass placed at the edges of swamps, and that they lay from five to seven eggs, olive-brown, spotted with darker brown.

PORZANA FUSCA.

(THE RUDDY RAIL.)

Rallus fuscus, Linn. Syst. Nat. i. p. 262 (1706); Gmelin, ed. Syst. Nat. i. p. 713 (1788).

Gallinula rubiginosa, Temm. Pl. Col. 387 (1825).

Porzana fusca (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 285 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 724 (1864); Blyth, Ibis, 1867, p. 171; Holdsw. P. Z. S. 1872, p. 476; Hume, Str. Feath. 1879, p. 113 (List Ind. Birds).

Ortygometra rubiginosa, Temm., Kelaart, Prodrum, Cat. p. 135 (1852).

Rallina fusca (Linn.), Schlegel, Mus. P.-B. *Ralli*, p. 20 (1864); Hume, Str. Feath. 1875, pp. 188, 500; id. Nests and Eggs, iii. p. 604 (1875); Salvadori, Ucc. di Born. p. 338 (1874); Hume, Str. Feath. 1878, vi. p. 467.

Limnobaenus rubiginosus, Sund. Meth. Nat. Av. disp. Tentamen, p. 131 (1873).

Râle brun des Philippines, Buffon, Pl. Enl. 773; *Tiklin brun*, id. Hist. Nat.; *Brown Rail*, Latham.

Korowaka, Sinhalese; *Neer kuruvi*, Tamil (MacVicar).

Adult male and female (Ceylon). Length 7·9 inches; wing 3·5 to 3·7; tail 1·3; tarsus 1·3 to 1·45; middle toe 1·4, with its claw 1·7; hind toe and claw 0·6; bill to gape 0·8.

Iris orange-red, eyelids reddish; bill olive-brown; tibia, knees, and soles dull orange-reddish; tarsus and top of toes reddish brown (*September*).

Forehead, head above the eyes, face, ear-coverts, fore neck and its sides, chest and centre of upper breast dull vinous red, enclosing a white chin and gorge; rest of the head and all the upper surface with the flanks dark greenish olive, pervaded with a rusty hue on the rump, upper tail-coverts, and tertials; quills and tail olive-brown; lower breast and abdomen brownish, barred and tipped with white, the whole pervaded with a slight rusty hue; sides of rump and under tail-coverts darkish olive-brown, with wavy bars of white; under wing-coverts tipped with white.

Young. "These entirely want the rufous tint, and have the entire chin and throat white, and the rest of the lower surface dull olive-brown, mottled or imperfectly barred with brownish white. Towards the end of November they begin to assume the rufous tint, which in their case is ferruginous and lacks the rich vinaceous hue of the adult, which first appears on the lores, cheeks, and ear-coverts, and then spreads in spots on to the lower throat, breast, &c." (*Hume*.)

A bird of the year in Mr. Bligh's collection has the forehead and round the eye only red, the lower part of the cheeks being whitish, and the fore neck and chest greyish, with indistinct barrings of brown and reddish, showing most plainly on the sides of the neck; upper surface less olivaceous than in the adult. Wing 3·65 inches; tarsus 1·3.

Obs. Consequent on Jerdon's description of the legs of this species as green, there have been several remarks on the subject of late years in 'Stray Feathers.' Dr. Stoliczka and Messrs. Oates and Hume testify to their being red, the latter gentleman stating that they are brighter in the breeding-season than in winter. He describes the legs and feet as being "red at all seasons, shaded with dusky on the joints and toes." The amount of dusky colour no doubt varies in individuals, both in winter and summer. I carefully noted the colours in a September specimen, and the tibia were as brightly coloured, if not more so, than any other part. However there is ample proof that Jerdon's description is erroneous, probably due to an oversight in the preparation of his MS.

This species varies in size. My measurements are taken from three specimens only, and are smaller than those of Indian specimens as recorded in 'Stray Feathers.' Mr. Oates gives the dimensions respectively of a pair, male and female, as:—length 8·55, 7·8 inches; wing 3·8, 3·75; tail 1·75, 1·7; tarsus 1·4, 1·46; bill from gape 1·0, 0·98. Mr. Hume's measurements of four female examples from the Calcutta district are:—length 8·5–8·7; wing 3·8–4·2; tail 2·1–2·2; tarsus 1·4–1·55; middle toe and claw 1·6–1·75; bill from gape 0·91–1·0.

Porzana (Rallina) erythrothorax, Temm. & Schlegel, from Japan and China, is considered to be doubtfully distinct from the present. It is said by Swinhoe to have longer toes, and the pectoral red not extending down so far upon the belly; on the other hand, Schlegel (*Mus. Pays-Bas, Ralli*, p. 21), writing of Japanese specimens, says:—"Absolument semblable à la *Rallina fusca*, mais d'une taille plus forte, aile 4 pouces 1 ligne à 4 pouces 2 lignes . . . doigt du milieu 14 lignes et demie à 16 lignes." These dimensions (4 inches 2 lines and 16 lines) for wing and middle toe do not, however, exceed Mr. Hume's of a female from Calcutta, viz. 4.2 and 1.75 inch (middle toe with claw). On the evidence of one Japanese example from the Swinhoe collection (Hakadodi, June) now before me, I am unable to look upon it in any other light but that of a somewhat larger or more robust local race of our bird—perhaps worthy of being called a subspecies of it. The distribution of colour, even to the slightly dusky wash on the lores, is absolutely the same; but the tint of the hind neck and upper back is slightly greener, and the red of the face and fore neck not quite so deep as in a Ceylon specimen. Its dimensions are:—wing 4.4 inches; tarsus 1.45; middle toe and claw 1.67; bill to gape 1.03. Its longer wing and stout bill are chiefly noticeable on a comparison with our bird.

Two other members of this genus found in India, and which *might* occur in Ceylon in the cool season, are:—

The Brown Rail, *P. akool*, Sykes. Brown above, with a white chin, and the breast and belly ashy brown; rump ashy brown: wing about 7 inches.

The Spotted Rail of Europe, *P. maruetta*, Leach, which is a cold-weather visitant to the empire. It has the upper surface olive-brown, marked with white, not unlike Baillon's Crake; but it has a pale eye-streak; the neck and breast are olivaceous, spotted with white, and the belly is white: wing 4½ inches.

Porzana bicolor, Walden, is another species from the Himalayan districts. The wing measures 4.5 inches; and its prevailing colours are ashy grey on the throat, neck, breast, abdomen, flanks, and thigh-coverts, the tail and coverts being darker grey, and the hind neck, back, rump, shoulders, and scapulars ferruginous olive. It has been lately discovered near Darjiling, and was described by the late Marquis of Tweeddale in the 'Annals and Magazine of Natural History,' 1872, ix. p. 47.

Distribution.—This Small Rail is migratory to Ceylon, appearing in September and probably departing again about April. It visits the island in very limited numbers, or it would be more often met with; and I am under the impression that, like the next species, it betakes itself chiefly to the hills. Layard mentions having only seen three specimens, all from Kotte: the time of the year is not stated; but it may be concluded that they were taken about November, at which season the natives of that district generally bring in birds to Colombo for sale. Several specimens were met with by me in Uva in September 1875; and on one occasion I surprised a pair together near Lunugalla in Madulsima. Mr. Bligh has met with it in the low country at Wellaway; and I have heard of it being seen about the marshes and paddy-fields of the Fort-Macdonald district.

Jerdon remarks, concerning the distribution of this species, that it is found throughout India, not very common in the south, but more abundant in the north, especially in the well-watered province of Lower Bengal. Mr. Hume likewise observes that it is pretty plentiful in Lower Bengal; and thence to the north-west it probably extends sparingly through the country; at any rate Dr. Stoliczka found it breeding in Cashmir at the Wolar lake. In this direction it is very rare, as it is not recorded by Messrs. Hume, Butler, or Adam from Rajpootana, Sindh, or Guzerat. In the opposite direction towards the East its range is more extensive, though even there it is not common. Mr. Oates procured a pair at Boulay in Upper Pegu; but in Tenasserim Mr. Hume has not heard of it occurring, though Blyth says it is common in Burmah. It no doubt occurs in the Malay peninsula, for it is found in the Straits in the island of Singapore, having been procured there by Herr Müller. In Java it would appear to be not uncommon, for Professor Schlegel tabulates five specimens from that island as being in the museum at Leiden. It was procured in Bornco by Schwaner, and in the Philippines by Messrs. Verreaux and Cuming. I am unable to say, from want of data, whether it is found in Cochin China; but further north the Ruddy Rail, which inhabits the Chinese empire, is set down by Swinhoe in his catalogue to be the same (*P. erythrothorax*) as the Japanese race.

Habits.—This Crake does not always confine itself to the vicinity of water, although it is found on the borders of streams and damp sedgy spots. I have met with it in a wood at some distance from water, and when it was flushed it flew a short distance and perched in a low tree. Its flight is not swift, although the movement of its wings is rapid.

Jerdon observes that it frequents "thick swamps, marshes, and the like; and it appears from the following account by Mr. Oates to be quite at home amongst floating vegetation. Of the pair he procured in Pegu he writes as follows:—"I have watched these birds for a long time. Close to my house there is a nasty dirty swamp overrun with reeds. Just at its end, about fifty yards from my verandah, there is a small comparatively clear piece of water; upon this piece of water these two little birds were to be seen every morning walking about briskly over the lilies; but whenever I attempted to get near them they would stalk away in the grass."

Nidification.—This species breeds in Lower Bengal; and in Cashmir, as I have already observed, it has likewise been found nesting. Mr. Hume found it breeding in Lower and Eastern Bengal from July to September, "making a nest of weeds and grass, reeds, or rush, just like Baillon's Crake, and in precisely similar situations, but somewhat larger and more substantial." The number of eggs, according to this author, varies from 3 to 5; and they are moderately broad ovals, somewhat pointed at the small end, and the shell with little or no gloss. They are of a "pinkish or creamy white, more or less streaked, spotted, and blotched with brownish red or reddish brown," with a number of pale inky-purple spots intermingled with the red markings at the large end. They vary from 1.16 to 1.27 inch in length by from 0.8 to 0.89 in breadth.

I have examined two eggs taken near Chilaw by the taxidermist of the Colombo Museum, and said to have been found in a nest "built on the ground at the edge of a paddy-field" (*MacVicar*). They somewhat resemble the eggs of this species, but are rather small, measuring only 1.08 by 0.86 inch and 1.12 by 0.83 inch; they are creamy white, spotted all over, but mostly at the large end, with reddish brown. It is very improbable that this race has bred in Ceylon; but it is difficult to assign these eggs to any other species.

Subgenus RALLINA.

Bill stouter than in the last, the wing more graduated, with the 4th quill the longest. Tail shorter, and the toes stouter, more scaled, and shorter than in *Porzana*; claws short. Plumage banded beneath.

RALLINA EURYZONOIDES.

(BROWN'S RAIL*.)

Gallinula eurizonoides, Lafresn. Rev. Zool. 1845, p. 368.

Porzana ceylonica, Blyth, Cat. B. Mus. A. S. B. p. 285 (1849, *nec* Gm.); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 725 (1864); Hume, Str. Feath. 1873, p. 440, et 1875, p. 188; Bourdillon & Hume, *ibid.* 1876, p. 405; Hume, *ibid.* 1878, vii. p. 465.

Corethrura zeylanica (Brown), *apud* Kelaart, Prodrum, Cat. p. 135 (1852).

Porzana zeylanica, Blyth, Ibis, 1867, pp. 171, 309 (*nec* Gm.).

Rallina eurizonoides (Lafr.), Gray, Hand-l. B. iii. p. 58 (1871); Tweeddale, P. Z. S. 1877, p. 767; Hume, Str. Feath. 1879 (List Ind. Birds), p. 113.

Rallina ceylonica, Holdsw. P. Z. S. 1872, p. 476 (*nec* Gm.).

The Rail, Brown, Illustr. pl. 37; *The Ceylon Rail*, Kelaart, *l. c.*; *The Banded Rail*, Jerdon; *The Chestnut-headed Rail*, *The Ferruginous-breasted Rail*, of some. Nordewind, Dutch in Ceylon (Layard); *Neer kuruvi*, Tamils (MacVicar).

Adult male and female. Length 9.5 to 10.0 inches; wing 4.7 to 5.0; tail 2.2; tarsus 1.6 to 1.75; middle toe and claw 1.45 to 1.55; hind toe and claw 0.55; bill to gape 1.2 to 1.25.

Iris mottled closely on the exterior portion with red-brown on an olive ground (after death the red-brown intensifies and spreads over the iris); bill dark brown, sides of lower mandible green; legs and feet plumbeous or plumbeous brown.

Male. Head, upper part of hind neck, its sides, fore neck, and chest fine ferruginous chestnut, enclosing a white chin and throat of more or less extent; lower part of hind neck, upper surface, and wings uniform brownish olive, brown on the inner webs of the quills, which are barred at the margin, near the base, with white; wing-coverts faintly tinged with rusty brown; breast, lower parts, under tail-coverts, thighs, and under wing-coverts blackish brown, broadly banded with white, which overcomes the ground-colour on the abdomen, this part being, in some, almost white. Some specimens have the occiput tinged with brown.

Female. Has the hind neck, occiput, and hind part of the crown brown, like the back; the forehead and front of crown chestnut-red, the colour passing over the eye and covering the face and ear-coverts, whence it passes over the sides of the neck to the chest; the lores are shaded with brown; the extent of the white on the throat is, I think, as a rule, greater in this sex than in the other. The barring of the underparts presents no constant difference to that in the male.

Young (?). Birds which I conclude are immature have the face and ear-coverts olive-brown, tinged with chestnut-red, the sides of the neck brown, and only the forehead chestnut; the red of the chest is of small extent and is sullied with brown.

Obs. Mr. Hume has shown, in his remarks on this species in 'Stray Feathers,' that Blyth's species, *R. amauroptera*, "distinguished by having less rufous on the nape," is only the female of this bird. Blyth described his species from Northern-Indian specimens, and arrived at the conclusion that it constituted a race from that part of the country. Some examples of the present Rail are said to have the smaller scapulars banded with white, like the allied species *R. fasciata*, to be presently noticed; but I have seen no Ceylonese skins exhibiting the slightest trace of this character.

* There are two other species of this little group, more banded than the present; I therefore discard the usual title "Banded Rail" and adopt the more suitable one, after its first describer, Brown.

The form inhabiting the Philippine Islands is somewhat darker in its chestnut or rufous coloration and has less white on the throat. An example from Manilla in the British Museum exhibits these characters, and has the rufous descending lower upon the breast and the black bands of the under surface broader than in Ceylonese and Indian skins. Its measurements are:—wing 5·3 inches; tarsus 1·65; bill to gape 1·03. Three examples (2 ♂, 1 ♀) from Cebu and other Philippine localities, in Captain Wardlaw Ramsay's collection, and kindly lent me by that gentleman, correspond with the Museum skin; they have the rufous of the head and hind neck very dark, and the chin is very pale rufescent or rufescent whitish; the black on the breast, abdomen, under tail- and under wing-coverts preponderates over the white. The female has the red colour descending from the head upon the hind neck. The dimensions are:—♂, wing 4·9–5·4 inches, tarsus 1·65–1·78, bill to gape 1·15; ♀, wing 5·4, tarsus 1·58, bill to gape 1·18. This Philippine race seems to me almost worthy of distinction as a subspecies, based upon its darker coloration and the fact of the female being similar to the male.

The Malaccan representative (*R. fasciata*, Raffles) of our bird differs in being smaller, and in having the wing-coverts and quills brown barred with white, the latter on both webs of course. The head, neck, and chest are dull rufous-chestnut, with the throat slightly paler; the lower parts are very broadly banded with black; the back and tail rufous-brown (Singapore, British Museum). Mr. Hume, in his exhaustive paper on the birds of Tenasserim, describes this species fully, and states that both sexes are alike. His measurements (5·0 to 5·3) for the wing of male examples are, however, in excess of what mine are for Ceylonese examples of *R. euryzonoides*: and from this I infer that the latter species varies considerably in size, for Ceylonese migrants of this bird must be identical with those which pass through India.

A very closely allied species from China is *R. mandarina*, Swinhoe. A specimen before me is more olivaceous on the back than our bird; it is a male, and the brown of the hind neck extends forward on the head to the bill, where it is tinged with the ferruginous line of the face and chest; the scapulars and wing-coverts are crossed sparingly with very white bands. The dimensions of this example are—wing 5·0 inches, tarsus 1·42, middle toe 1·42, bill to gape 1·08; the chin is whitish, and the white bands of the lower parts narrower than the black.

Rallina canningi, Tytler, from the Andamans, somewhat resembles our species, but is much larger, measuring from 6·3 to 6·5 inches in the wing. I have not personally examined this bird; but it is described as being very handsome, with the "upper parts and breast of a rich dark colour, approaching to maroon; a slight olivaceous tinge about the rump; throat less deeply coloured; the abdominal region, flanks, and plumes black, with from two to four transverse white bands on each feather" (*Blyth*).

The first description of this species, until recently, has always been ascribed to Gmelin, and his name *zeylanicus* (afterwards modified into *ceylonicus*) almost invariably assigned to it. The late Marquis of Tweeddale, however, pointed out (P. Z. S. 1877) that Gmelin did not found his description on Brown's figure "*The Rail*" (p. 94, pl. 37 of his 'Illustrations'), but upon another bird described by Brown as a "*Rail*" (p. 96, pl. 38). Gmelin quoted p. 96 when describing his *Rallus zeylanicus*, at the same time referring, in error, to the right drawing of this species in plate 37. This, however, is not considered as proof that he had Brown's *The Rail* in view, for his diagnosis does not apply to it. The next oldest title given to the bird is that of Lafresnaye, and it has therefore been adopted.

Distribution.—This interesting Rail arrives in Ceylon, appearing, so far as has been observed, chiefly on the west coast, at the end of October and the beginning of November. When the north or "longshore" wind sets in those who are acquainted with this bird at Colombo begin to look out for it, as it arrives on the coast in an exhausted state, and on coming to *terra firma* conceals itself in the first place which it can find, very generally choosing houses and hiding behind furniture, in thatched roofs, or even in wellington boots. I first heard of it from my friend Mr. Holdsworth, who found one in his bedroom at the Galle-face Hotel. Mr. Bligh afterwards informed me of several having been captured in the same building, which abuts on to the sea-beach, and affords the exhausted travellers a speedy but unsafe refuge. Some years greater numbers seem to arrive than others. In October 1876 several were caught at Colombo, one of which I found one morning early in the new buildings at the corner of Chatham and Queen's Streets; and a day or two afterwards another was captured in my back yard at the new officers'-quarters, while a third was found in the Surveyor-General's office. It is only at this season that they are noticed on the coast, and a short time afterwards they have entirely disappeared and are not often to be found even in the low country of the interior. They take their departure for the hills and are not uncommon during the cooler months about Kandy, Deltota, Hewahette, and Maturata. Mr. Bligh has recently sent me an example which he procured on the summit of the Harangolla patnas, close to the Trigonometrical station; he has likewise shot it in jungle above Catton estate, at an elevation of over 5000 feet; and Mr. Thwaites tells me that it has been killed at

Nuwara Eliya. So far as I have been able to ascertain, it is seldom seen after February on the hills, and it leaves the island much more unobserved than it came. It does not seem to be common in the Galle district during the season of its arrival.

From the writings of Indian naturalists we are able to gather but little concerning either the distribution or the habits of the "Banded Rail." Jerdon compares its range to that of the last species; but it would appear to be a much rarer bird, and is probably migratory to the south. In this locality I see nothing recorded of its occurrence, save in a remark by Mr. Bourdillon concerning a specimen which was procured by a Mr. Ferguson at the foot of the Travancore hills. It would appear to be common in Upper India; but even in that region few naturalists seem to have observed it. In the North-west it is apparently unknown; and even from Mr. Ball's exhaustive list of the birds of the eastern district of the Peninsula it is wanting. Mr. Hume speaks of it as occurring at Cawnpore "and other places in Upper India;" but he does not seem to have noticed it, even rarely, in the Calcutta Bazaar, where in the cold season all the other Indian members of the family are occasionally to be met with. It occurs in Pegu. Mr. Oates records the capture of a specimen in the verandah of the Deputy Commissioner of Thayetmyo. In Tenasserim it is replaced by *R. fasciata*.

There is but little to record concerning the *habits* of this Rail besides its singular propensity, already noticed, for concealing itself in houses and buildings. Layard writes of it:—"I found one in the well of my carriage, another in the folds of the gig-apron, and a third in a shoe under my bed!" The individual which I discovered in the buildings, above alluded to, when I approached it ran slowly along by the walls and among the joists of the flooring, with its neck stretched out Rail-fashion, and did not appear very anxious to escape. It was evidently bewildered with the strange abode in which it found itself; and this, combined with physical exhaustion after its long flight, made it so indifferent to its fate that it was caught with no difficulty.

It would seem reasonable to infer that these Rails follow the mainland down to Cape Comorin and then fly across the Gulf of Manaar at night, aided by the northerly wind blowing at the time of their migration. Their Dutch name, it is needless to remark, is founded on this latter fact.

In the hills it frequents sedgy places near streams in the coffee-estates, and likewise the paddy-fields of the Kandyans; but it is not unfrequently found in dry places far removed from water, and into which it finds its way during its nocturnal wanderings.

Its breeding-haunts appear still to be undiscovered, and I am therefore unable to give any particulars concerning its *nidification*.

Genus HYPOTÆNIDIA.

Bill longer than in the last, more slender, but with the gonys pronounced; nasal depression produced in the form of a groove. Wings with the 3rd quill the longest; the secondaries more lengthened than in *Rallina*. Toes longer than in that genus, equal to the tarsus; hind toe proportionately shorter.

Plumage banded above.

HYPOTÆNIDIA STRIATA.

(THE BLUE-BREASTED RAIL.)

Rallus striatus, Linn. Syst. Nat. i. p. 262 (1766, *ex* Brisson); Gmelin, Syst. Nat. i. p. 714 (1788); Blyth, Cat. B. Mus. A. S. B. p. 285 (1849); Layard & Kelaart, Prodrömus, Cat. B. App. p. 62 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 726 (1864); Blyth, Ibis, 1867, p. 172; Holdsw. P. Z. S. 1872, p. 476.

Rallus gularis, Horsf. Trans. Linn. Soc. 1821, xiii. p. 196.

Hypotænidia striata (Linn.), Schl. Mus. Pays-B. *Ralli*, p. 24 (1865); Swinhoe, P. Z. S. 1871, p. 415; Salvadori, Ucc. di Born. p. 336 (1874); Walden, Tr. Z. S. ix. p. 232 (1875); Hume, Nests and Eggs, iii. p. 605 (1875); id. Str. Feath. 1875, p. 189; Armstrong, *ibid.* 1876, p. 349; Oates, *ibid.* 1877, p. 165; Ramsay, Ibis, 1877, p. 471; Davison, Str. Feath. 1878 (B. of Tenass.), p. 468; Hume, *ibid.* 1879, p. 70 (B. of Malay Penin.), et p. 113 (List Ind. Birds).

Tiklin rayé, Buffon; *The Striated Rail* of some. *Wade-kodi*, Telugu (Jerdon).

Korowaka, Sinhalese; *Burok-Burok-peai*, Borneo (Mottley).

Adult male and female. Length 10·0 to 11·5 inches; wing 4·6 to 4·7; tail 1·6; tarsus 1·55 to 1·65; mid toe and claw 1·8; bill to gape 1·6 to 1·75.

Iris red; bill—culmen dark brown, paling to slate at the tips, the sides of both mandibles red; legs and feet olivaceous or livid brown, with the joints darker; claws pale brown.

Dr. Armstrong records the iris of a Rangoon example as "light yellowish brown."

Male. Forehead, top of the head, nape, and hind neck ferruginous chestnut, the centres of the feathers dark; lower part of hind neck, back, wings, and tail brownish black, paling at the margins of the feathers to olive in some and rufescent olive in others, each feather crossed with wavy bars of white; quills blackish brown, barred with white; lores, face, fore neck and half its sides, chest, and upper breast slate-blue, enclosing a white chin and gorge; breast, belly, flanks, under tail-coverts, thighs, and under wing-coverts blackish brown (in some olive-brown), closely barred with wavy white bands, broadest on the flanks; under tail-coverts with deep buff-white tips and bars.

Female. The ferruginous chestnut-colour of the head does not descend so much upon the hind neck; otherwise the same.

The coloration of the upper surface is variable in my Ceylonese specimens, probably the result of age. Some are more olive than others, this colour occupying, in such cases, much more than the margin of the feathers. There is more white on the under tail-coverts in some specimens than in others.

Young. A presumed immature bird in the British Museum has the head and hind neck rufescent, the crown striped with black; chin and throat whitish; fore neck washed with rufescent; back and wings paler than in adults, but barred the same; flanks scantily barred with white; middle of the breast and abdomen whitish.

Obs. This species, judging from the observations of Indian observers, is subject to some variation in the colour of the soft parts and likewise in size; that is, if Jerdon's or Mr. Hume's measurements (Str. Feath. 1874, p. 302), which indicate a maximum of 5·25 and 5·2 inches respectively in the wing, be correct. I have not met with a Ceylonese specimen exceeding 4·7 inches. Professor Sehlegel's dimensions, taken from a series from Java, China, Luzon, and Cochin China, are 4 inches 1 line to 4 inches 8 lines. A Bornean individual in the British Museum measures 4·5 inches, and a small series of Philippine, Indian, and Burman examples kindly lent me by Captain Wardlaw Ramsay vary from 4·5 to 4·8 inches. Philippine individuals are very dark, in fact almost inseparable from the Andaman race or subspecies *H. obscuriora*, Hume (*H. ferrea*, Walden), which I will presently notice; the black portions of the upper-surface feathers are much darker and extend over them, leaving the margins and terminal

portions only olive; the ferruginous colour of the head is darker than in Indian specimens, and is more extensively marked with black on the nape; the slaty colour of the breast is also purer in tint than in Indian birds. These examples are from the islands of Cebu and Leyte. A Javan specimen in the national collection has the head, back of neck, and upper surface as in Ceylonese birds; but the slate-colour of the fore neck descends further upon the breast; the amount of white on the throat is the same. A Rangoon example of Captain Wardlaw Ramsay's has the upper surface like that of my specimens, but the head and hind neck are darker in tint. A Banjermassing skin is almost identical with a Ceylonese, but the markings of the under tail-coverts are more buff. Malaccan skins are likewise very similar.

There is considerable variation in the bills, both as to length and proportionate thickness; but those of females, which are smaller birds, are constantly of less size than in the males.

The Andaman race (*H. obscuriora*) has been separated on account of its large size and darker colours. Mr. Hume gives the wing-measurement (Str. Feath. 1874, p. 302) as 5·4 to 5·5. Two examples in Captain Wardlaw Ramsay's collection from S. Andaman measure (♀) 5·2 inches, (♂) 5·5 in the wing, and 1·7, 1·8 in the bill from the gape. They are certainly much darker than Indian, Ceylonese, and Burman skins, but *scarcely* darker than a skin from Cebu; and the difference is owing simply to the black, which is a little more intense and spreads more over the feather. The ferruginous tints of the head and hind neck are certainly darker than in continental specimens; but the same is the case in the Philippine birds. It is at best a very closely allied race.

Gray includes 13 species of these short and stout-billed forms of *Rallus* in his 'Hand-list,' chiefly from Malaya and the Pacific islands.

H. pectoralis (Cuv.), from the Pacific islands and Australia, is somewhat similar to the present, but has more black on the head, a white supercilium, and there is a broad fulvous band (its chief characteristic) across the chest; the chest is very pale blue-grey, and the under surface is more boldly barred than in *H. striata*. A Samoan example measures 5·3 inches in the wing.

H. torquata is peculiar to the Philippines; and another species found there, *H. philippensis*, extends to Celebes, Australia, and New Zealand.

Distribution.—This handsome Rail is a rare bird in Ceylon, and is, I should say, very local in its habitat. Layard met with it at Pt. Pedro, where a living example was brought to him; he also received it from the Batticaloa district. I have myself only met with it in the neighbourhood of Negombo, where I found it frequenting the small scrub-covered islands at the head of the lake, and near the canal in the swamp of Mutturajawella. The taxidermist of the Colombo Museum, Mr. Hart, has, I believe, also met with it in the Western Province. I am inclined to think that it is migratory, as I have not seen it at any other season than during the north-east monsoon.

In the south of India, Mr. Davison procured it at Kotagherry, in the Nilghiris, but it does not appear to be common in the south. Jerdon, however, affirms that "it is found throughout India, from the extreme south to the Himalayas and the Punjab, especially in the cold weather. . . . It is rare," he says, "in the Carnatic and Deccan." It is not recorded by either Messrs. Bourdillon, Fairbank, Ball, or Butler from any of the districts aforementioned in this work; and there is no reason, I think, to infer that it extends towards the north-west of the empire, as its distribution is manifestly easterly. In Lower Bengal it is not uncommon; and we find Mr. Hume recording it as being brought into the Calcutta market in the cool season. At Sylhet, in the north-east corner of the Presidency, Mr. Cripps found it common in May and June. Eastward of the bay it appears to be locally distributed, but perhaps, on the whole, more numerous than in India. In Upper Pegu Mr. Oates did not meet with it, but had a specimen sent to him which was shot near Prome; but in Lower Pegu it is common, he says. At Rangoon and Tonghoo Captain Wardlaw Ramsay likewise affirms it to be plentiful; but Dr. Armstrong only saw it in the vicinity of Syriam. Further south, in Tenasserim, Mr. Davison observes that it is sparingly diffused over the more level and open tracts of the central and northern portions of the province.

From the Malay region it has more than once been recorded; in the list of the birds of the western half of the peninsula we find it noted from "Malacca, Neahls, and Singapore." In Java it is probably not uncommon; Professor Schlegel records several examples from that island in the Leyden Museum. It was obtained there both by Horsfield and Boie. In Sumatra Raffles procured it; and in Borneo it has been obtained at Banjermassing by Mottley, and at Sarawak by Doria and Beccari. Everett shot it in Marup; and

further to the east it was obtained by Wallace in Celebes. In the Philippine Islands, from where it was first made known and described, it is found in Luzon.

From the Malay Peninsula it probably extends through Siam to Cochin China, where it was procured by Diard. It inhabits the island of Formosa; and from China Schlegel records it, though Swinhoe does not seem to have met with it on the mainland.

Habits.—I found the Blue-breasted Rail frequenting thick underwood near the margin of the water surrounding the small islands in the Negombo lake. This fine sheet of water, which is brackish, discharges into the sea a mile from these islands, and the water around them is quite salt. On one occasion I observed the birds feeding on the tidal mud at the edge of the water in the same manner as a Sandpiper, and they allowed me to approach within shot before running up the bank into the scrub. I met with them singly, but I saw two not far from each other. Their stomachs contained tiny mollusca and very small insects.

Although, as Jerdon says, it frequents marshes and grassy ground by the sides of tanks and rivers, I suspect that it affects jungle-cover rather than moist vegetation; for Mr. Davison observed that in Tenasserim it confined itself, as "elsewhere, to cover in the vicinity of vegetation." Dr. Armstrong merely writes that he saw it in "marshy ground." Mr. Cripps, however, shot two which were walking about a piece of weed-covered water in Sylhet; and doubtless their choice of situation depends on local circumstances.

Nidification.—In Burmah the present species breeds from July till October. Captain Wardlaw Ramsay found it breeding at Tonghoo during the months of August and September; and Mr. Oates found its nest in July and as late as the 11th of October. The latter gentleman describes the nest as being a "mere pad of soft grass, leaves, and the outer rind of the elephant-grass, about 8 inches in diameter and 1 thick, placed in a tuft of grass, always near water, and raised a few inches above the ground. The coarse grass growing round paddy-fields is a favourite locality." He further says, "the bird sits very closely, and the nest is not easy to discover. The male bird sits on the eggs, at least at times; and I killed one with a stick while he was sitting on seven eggs." These vary in number from four to seven. "Some are," writes Mr. Oates, "almost glossless, others are considerably glossy. The ground-colour is pinkish stone, pale when fresh, and darkening as incubation proceeds. The shell-markings consist of blotches and splashes of pale purple, evenly but sparingly distributed over the egg; and the surface-marks consist of large blotches and streaks of rather bright rusty brown. These marks are larger at the thick end than elsewhere, and run chiefly in the direction of the longer axis of the egg. In some eggs the marks form a distinct cap and the shell-marks are very fine. The average size of 31 eggs is 1.34 by 1.00."

Mr. Hume observes that eggs sent him by Mr. Cripps from Sylhet, where the bird breeds in May and June, are of the regular Waterhen type, and the ground-colour varied from white to salmon-pink. The markings consisted of "spots, specks, streaks, and blotches of maroon-red, and smaller spots and streaks of dull inky purple or grey." Dimensions 1.33 to 1.36 by from 1.03 to 1.05 inch.

Genus RALLUS.

Bill long, slender, slightly curved; upper mandible deeply grooved; nostrils linear, placed close to the margin. Wings short, somewhat rounded, the 2nd and 3rd quills the longest, the 1st equal to the 7th. Tail short, cuneate. Legs rather short. Tibia bare for less than the length of the hind toe and claw. Tarsus shorter than the middle toe, covered in front with broad transverse scales; outer toe considerably longer than the inner; hind toe short.

Sternum exceedingly narrow, compressed near the centre almost to the keel, with a very deep and narrow notch in the hinder part.

RALLUS INDICUS.

(THE INDIAN WATER-RAIL.)

Rallus indicus, Blyth, J. A. S. B. 1849, xviii. p. 820; id. Cat. B. Mus. A. S. B. p. 286 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 726 (1864); Swinhoe, P. Z. S. 1871, p. 415; Holdsw. P. Z. S. 1872, p. 476; Blyth, Ibis, 1873, p. 80; Swinhoe, Ibis, 1873, p. 363, et 1874, p. 163; Hume, Str. Feath. 1875, p. 416; Blakiston & Pryer, Ibis, 1878, p. 225; Hume, Str. Feath. 1879 (List B. of Ind.) p. 113. *Kuina*, Japanese (Blakiston).

Adult. (Ceylon: Poole Museum.) Length (from mounted specimen) 10·0 inches; wing 5·0; tail 2·2; tarsus 1·45; mid toe, without claw, 1·45; hind toe 0·35; bill to gape 1·45, height at base 0·34.

Not mature. (Bengal.) Wing 5·2 inches; tail 2·1; tarsus 1·5; middle toe, without claw, 1·5; bill to gape 1·56.

Female. (Japan: not mature; Swinhoe collection.) Wing 5·0 inches; tail 2·2; tarsus 1·4; middle toe, without claw, 1·5; bill to gape 1·5, height at base 0·33.

“Iris red-brown; bill dull red, dusky on the culmen and tip; legs and feet dirty pale green.” (*Jerdon.*)

(Ceylon.) Head, nape, and hind neck, and the central portion of the feathers of the back, scapulars, tertials, and tail brown-black, the margins of the feathers clear *yellowish* olive, very narrow on the head, and increasing on the back and remaining aforesaid parts, those of the tertials being very broad; edge of the wing white; lesser coverts and the inner feathers of the median and lesser series concolorous with the margins of the back-feathers; primary-coverts, primaries, and secondaries dark brown, the edge of the 1st quill somewhat pale, the margins of the tail-feathers dusky than the back; above the lores, on each side of the forehead, pale greyish, passing over the eye into the pale bluish grey of the sides of the head, face, fore neck, chest, and breast; lores dark brown, passing beneath the eye in a *well-defined stripe* to the ear-coverts; chin and gorge whitish, blending into the surrounding grey; flanks, sides of the abdomen, and the under tail-coverts black-brown, banded with white, except on the under tail-coverts, which are margined with it; under wing blackish brown, banded with white, along the edge white; thighs brown.

Obs. The above description is taken from the faded Poole specimen, aided, as regards the tints, by a reference to the Bengal and Japanese skins*; the distribution of colour is the same in each, and so are the tints, as can be seen by looking at those parts which happen to have kept their colour in the first-named example.

* These are the only three examples I can trace anywhere in England. The species is wanting in the British Museum; and there is not a single specimen in the immense collection amassed by the late Marquis of Tweeddale, and now in the possession of Capt. Wardlaw Ramsay. The Bengal and Japanese examples are in Mr. Seeborn's museum.

Immature. The Japanese (Hakodadi) bird kindly lent to me by Mr. Seeborn presents the appearance of an immature bird, as it has the same character as examples of the European species which are not fully adult, namely, the outer series of wing-covert feathers barred with white; they are much more conspicuously marked than in an Essex skin of *R. aquaticus* before me, and the white bars are set off with black borders.

The Bengal bird is paler than the Japanese, and, judging by the wing-coverts, is an older bird, for they are marked with only a few bars of white; the chest and breast-feathers, however, are tipped with white, and in some places tinged with brown; the under tail-coverts are black, banded with white.

I look upon the present species as a well-marked eastern *race* of the European Water-Rail. Its describer, Blyth, separated it from the latter on account of its larger size, stouter bill, the stripe under the eye, and the different tint of the blue-grey. The first character scarcely holds good, I think, as the bill in the European bird varies: an example from Essex in my collection measures from forehead to tip 1.39, height at base 0.28; another fine male in the flesh now before me measures in the same way 1.63 and 0.4 inch. The remaining dimensions of the latter are—tail 2.3 inches, tarsus 1.7, middle toe 1.8: the difference in size, therefore, is only perceptible in the wing, as far as I can judge by the material at my disposal. Jerdon's dimensions are—length $10\frac{1}{2}$ inches, wing 4.5 to 5.0, tail 2.0, tarsus 1.75, bill at front 1.5. The stripe seems to be a good character, as also the different colour of the face, fore neck, and chest, which are fine blue-grey (an altogether darker colour) in *R. aquaticus*. A further distinction, however, lies in the tint of the pale portion of the upper plumage, which is dull olive in *R. aquaticus*, and yellowish olive in *R. indicus*, although Asiatic specimens of the former seem to have the margins of the feathers yellower than European. The under tail-coverts are nearly all white in the European bird, whereas in the Indian they are black, margined with white.

Distribution.—The Ceylonese habitat of this Rail rests on the evidence of several examples which were procured at Jayelle by Lieut. Long, of the Ceylon Rifles, and given to Layard. They are referred to by this naturalist as follows:—"Three or four of these Rails were shot in the Jayelle paddy-fields, near Colombo, by Lieut. Long, of H.M. Ceylon Rifle Regiment, to whom I am indebted for these and several other interesting specimens." I infer that they were all procured at the same time, and during the cool season, as the species must, of course, be migratory to Ceylon, and as it is only at that period that this locality, which is about 14 miles out of Colombo, on the Negombo road, is resorted to by sportsmen.

In India it is scarce, as we do not find any mention of it by the numerous contributors to 'Stray Feathers' since the commencement of the journal in 1873. Jerdon writes of it:—"It appears to be rather a rare bird in Central and Southern India, and has chiefly been found during the cold season, being probably migratory, like some of the other Rails. . . . I have only seen it myself in Northern India; and Adams says that it is common in the Punjab." It is one of the species which Mr. Hume has noticed in the Calcutta market, with the remark that *P. akool* is rarer than it. Blyth notices two specimens in his catalogue, both procured near Calcutta, and says ('Ibis,' 1873) that he has seen dozens from Lower Bengal.

I do not find that it has been noticed by any one in the Burmese countries; but, notwithstanding, Swinhoe records it from China on the evidence of examples procured at Tientsin. This author likewise records a specimen from Hakodadi in Japan; and in their catalogue of the birds of these islands, Messrs. Blakiston and Pryer observe that it is a very common bird on banks of streams and ponds, is migratory to Yezo, and breeds about Yokohama. The localities they record it from are Yezo, Tokio, Yokohama, and Oyama in Legami. The Water-Rails procured by Dr. Scully in Kashgar are identified as *R. aquaticus*, which proves that the Indian species ranges only to the north-east of the empire, and is replaced to the north-west by the European bird, which, according to Blyth, has been sent to Mr. Gould from India; and which is doubtfully included by Hume in his recent list of Indian birds, not having been met with by any collectors of late years.

Habits.—In its economy the Indian Water-Rail does not differ from its European and Western-Asian ally, which it so closely resembles. Jerdon remarks that it frequents marshy ground, generally in rather thick covert. The locality which it seems to have chosen to frequent in Ceylon is eminently adapted to its habits. The Jayelle paddy-fields (a great resort for Snipe) are situated at the northern extremity of the great Mutturajawella swamp, and consist in parts of rushy morasses, in which the Water-Rail would find ample shelter and food. Its European relative frequents the rushy, sedgy borders of streams, and runs through the thick vegetation in a crouching position, with its neck stretched out, looking more like a rat than a bird. It

is difficult to flush, except when driven by hard frost into open places near unfrozen springs, &c., when it will lie close and get up under one's feet, flying with a moderately quick, but rather laboured flight. I have no doubt the present race is exactly similar in all its actions. The stomach of the Water-Rail is very muscular, and in it large pieces of gravel are sometimes found, swallowed, perhaps, to aid its digestion.

Nothing has been recorded of the nesting of this species.

Genus GALLINULA.

Bill shorter than in *Rallus*, deep at the base, much compressed; the culmen prolonged back upon the forehead into a small shield. Nostrils advanced. Wings rounded; the 2nd and 3rd quills the longest, and the 1st shorter than the 6th. Tail moderately short and rounded. Legs and feet stout. The tarsus compressed and shorter than the middle toe; tibia bare just above the knee. Tarsus shielded with transverse scutes in front, reticulate behind; anterior toes edged with a narrow membrane; hind toe much compressed.

GALLINULA CHLOROPUS.

(THE COMMON WATERHEN.)

Fulica chloropus, Linn. Syst. Nat. i. p. 258 (1766).

Gallinula chloropus (L.), Lath. Ind. Orn. p. 770 (1790); Blyth, Cat. B. Mus. A. S. B. p. 286 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 718 (1864); Gould, B. of Europe, pl. 342 (1837); Schlegel, Mus. P.-B. *Ralli*, p. 45 (1865); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 475; Saunders, Ibis, 1871, p. 225; Shelley, B. of Egypt, p. 275 (1872); Von Heuglin, Orn. N. Ost-Afr. ii. p. 1225 (1873); Hume, Str. Feath. 1873, p. 250; Adam, *t. c.* p. 398; Irby, B. of Gibraltar, p. 144 (1875); Hume, Nests and Eggs, iii. p. 597 (1875); Walden, Trans. Z. S. 1875, ix. p. 228; Hume, Str. Feath. 1875, p. 187; Butler & Hume, *ibid.* 1876, p. 20; Scully, *t. c.* p. 192; Butler, *ibid.* 1877, p. 224; Blakiston & Pryer, Ibis, 1878, p. 225; Davison & Hume, Str. Feath. 1878 (B. of Tenass.), p. 466; Ball, *ibid.* vii. p. 229; Cripps, *t. c.* p. 306; Hume, *ibid.* 1879 (List of Ind. B.), p. 113; Dresser, B. of Eur. pt. 74 (1879).

Gallinula akool, Jerdon, Cat. B. S. India, Madr. Journ. 1844-45, xiii. no. 332.

Gallinula parvifrons, Blyth, J. A. S. B. 1843, xii. p. 180.

Gallinula burnesi, Blyth, J. A. S. 1844, xiii. p. 736.

La Poule d'eau, Buffon; *Moorhen*, commonly in England; *Gallinha de agua*, Portuguese; *Waterhoentje*, Dutch. *Di djadj el ma*, Arabic (Von Heuglin); *Zelya-kahal*, Moorish (Favier, *fide* Irby); *Khodan Kharonah*, Turki (Scully); *Godhan*, Hind.; *Jumbu-kodi*, *Boli-kodi*, Telugu; *Jal-murghi*, Hind.; *Dakak paira*, Bengal. (Jerdon); *Ban*, Japan.

Adult male and female. Length (Turkestan) "12.2 to 12.8 inches" (Scully); wing 6.5 to 7.3; tail 3.0 to 3.1; tarsus 1.8 to 2.1; middle toe 2.2 to 2.3, its claw 0.45; bill to gape 1.05 to 1.1, at front, from casque to tip, 1.4. The larger measurements refer to females. These dimensions, except the "length," are from a series of examples in the British Museum. An example in the Poole collection, procured by Layard in Ceylon, measures in the wing 6.5.

Dr. Scully's Turkestan measurements for wing in adults are 6.55 to 6.9, weight 6.2 to 6.4 oz.

A fine male in my own collection from Wales measured in the flesh:—Length 13.5 inches; wing 7.2, expanse 22.5; tail 3.1; tarsus 2.1; middle toe without claw 2.5, claw (straight) 0.6; bill to gape 1.25, at front from casque 1.6.

Iris red, with a slaty external edge; bill and casque, to beyond nostril, cherry-red, apical third (but more on the lower than the upper mandible) lemon-yellow; legs and feet yellowish green, front of the tarsus yellower than the rest; above the knee an orange-red garter, which varies in extent and brightness.

Head and neck slaty black (with an olive gloss in a strong light), passing into slaty on the lower part of the hind neck, and on the chest, breast, and upper flanks, the breast being paler than the rest of the fore parts; back, scapulars, and wing-coverts dusky brownish olive, darkening into rusty brown on the tertials and upper tail-coverts; winglet, primaries, and secondaries blackish slate; margin of the first quill and of the outer winglet-feather, the edge of the metacarpal coverts and of the wing from the shoulder to the winglet white; tail slaty black; a broad stripe of white on the upper webs of the flank-feathers; abdomen, vent, and thighs slaty bluish, the feathers fringed with white; central under tail-covert feathers coal-black, the lateral plumes (which are longer than the black central ones) pure white; under wing brownish black, the feathers faintly tipped with white.

The white stripes on the flanks vary in individuals as regards size and number; and the outer webs of the 1st quill and winglet-feather are scarcely white in some.

Young chick. Legs dark grey; iris greyish brown; bill red. Dark sooty brown, with white tips to the feathers of the chin.

Immature. Head and the upper parts olive-brown; throat whitish and ashy; feathers of the lower part of the breast greyish, tipped with whitish; the flank-stripes small and terminated with fulvous; bill dusky olive, reddish at the base of the upper mandible; shield small; legs and feet greenish; tarsus not so yellow as in the adult; no red garter above the knee. (October: Wales.)

An immature example from Manilla corresponds with the above; the whitish feathers of the chin and fore neck are tipped with blackish.

Obs. This is one of those species (spread over a large portion of the globe) which not unfrequently exhibit in individuals, and according to locality, external points of difference, but not to such an extent or of such a constant character as to admit of its division into races. It is in the matter of dimensions and size of frontal casque that the present bird chiefly varies. After an examination of a large series, Mr. Dresser comes to the conclusion that Indian examples differ from European in having a shorter wing and a larger frontal plate, reaching as far back as the anterior corner of the eye, or to within 0.15 inch of it. In the majority of European examples, so far as my personal examination tends to prove, there is a space of about 0.2 between the eye and the side of the plate; but there is doubtless some variation in this respect both in India and Europe. Indian examples decidedly appear to average shorter in the wing, as will be seen by a reference to Dr. Scully's measurements above quoted, as also by the fact that Mr. Hume tabulates his Sindh specimens at from 6.9 to 6.6 in the wing*, the smaller of which dimensions, however, relates to *females*. Schlegel's measurements of Asiatic and Philippine skins are:—Japan, wing 6.28 to 6.66; China, wing 6.18; Philippines, wing 6.25 to 6.34. The South-African race is smaller than the above—wing 6.05 to 6.3. Blyth's *G. burnesi* from Sindh is, in all probability, the immature of the present species. It was separated on account of its smaller size, and the outer web of the 1st primary being white, as also the border of the outer winglet-feathers and the orange garter being less developed; but these characters apply to immature *G. chloropus*. Besides which, Mr. Hume remarks that the specimens he assigns to this race have a smaller frontal plate, a white chin and throat, and a brown head, nape, and back—all of which are characters of the young of the common Moorhen. The American form (*G. galeata*) appears to be scarcely separable from the European, possessing merely a longer wing, which, according to Mr. Dresser's measurements of a series, varies from 6.7 to 7.4 inches.

The race inhabiting Madagascar has been separated by Professor Newton as *G. pyrrhorhoa*, on account of having the frontal plate larger, the legs yellow, and the under tail-coverts buff.

Gallinula haematopus, Temm., from Celebes, is closely allied to the present species, but differs notably in wanting the flank-stripes, and the back is slaty bluish, not olive-green. An example in the national collection measures in the wing 7.3 inches, tarsus 2.3. The Moorhen of the Hawaiian Islands appears to be an interesting local form, which, like the last-named, is really a good species, inasmuch as its distinguishing characters do not entirely depend upon the very variable frontal shield, or a difference in size, but upon the coloration of the under surface, which wants the white markings on the abdomen, although it possesses the white flank-stripes. The frontal shield is, however, very large, reaching almost beyond the posterior corner of the eyes. It has been lately separated as *G. sandvicensis* by Dr. Streets, U.S. Navy.

Distribution.—The Common Waterhen does not appear to be a permanent resident in Ceylon, or it would be more often met with. It is exceedingly rare in the island; and I infer it is a visitor from the adjoining coast, wandering south, perhaps, during the prevalence of high northerly winds, and, after it reaches the shores of Ceylon, perhaps becoming stationary. It is possible, however, that, as it is in some parts of the world a bird of passage, migratory stragglers may visit Ceylon, returning again to India. But it has been so seldom observed in the island that any hypothesis as to its visits must remain mere conjecture until further observations have been made.

At present I only know of its having been twice met with. Layard, with his usual good fortune, obtained one specimen in a marsh near Pt. Pedro, and thus added the species to the avifauna of Ceylon. Recently a second example came under the notice of my friend Mr. Parker, and was shot in April this year (1879) at Nikaweratiya tank on the Kurunegala and Puttalam road. This is a large sheet of water, and a likely spot for such a bird as the Moorhen, which may perhaps inhabit other extensive tanks in the northern district of the island.

* And if we unite the supposed smaller North-Indian race *G. burnesi*, Blyth, these measurements fall as low as 6.0 inches.

In India the Moorhen is generally diffused throughout the country, and inhabits both the hills and the plains. It breeds as high as Ootacamund in the Nilghiris, and must therefore be a permanent resident in the uplands of Southern India. It does not, however, seem to have been met with by either Mr. Bourdillon or Dr. Fairbank, from which I infer that it is very local in its distribution. From the northern parts of India it is recorded by all who have collected of late years. Mr. Hume says that it abounds in every swamp and "broad" in Sindh. Captain Butler notes it from tanks between Deesa and Ahmedabad, and particularly from those near Milana, 18 miles from the former place; it is not, however, so common in this region as in Sindh. In the Sambhur-Lake district, according to Mr. Adam, it abounds. Messrs. Davidson and Wender say that it is not rare in the Deccan. Passing over the north-eastern region of the peninsula, we find Mr. Ball recording it from the Rajmehal hills, Bardwan, Nowagarh, and Karial, and Mr. Hume from Raipur and Sambalpur, south of the Mahanadi; the latter gentleman also observes that it is brought into the Calcutta market at times; and Mr. Cripps has met with it in February in Furreedpore. In North-eastern Cachar Mr. Inglis affirms that it is very common; and the same is recorded of it as regards Upper Pegu by Mr. Oates. In Tenasserim it is said to be confined to the north and central portions of the province; and Mr. Davison procured one specimen at a place called Shymotee.

Throughout China and Formosa it is, says Swinhoe, to be found, and, according to Père David, is abundant near Pekin. Crossing over to the Philippines, we find it again an inhabitant of that extensive archipelago; Cuming procured it there; and Lord Walden cites (*l. c.*) two examples from Luzon obtained by Herr Meyer. It extends northward to Japan, and is included in Messrs. Blakiston and Pryer's list of birds as frequenting Tokio, Yezo, and Yokohama.

Returning now to India, and following it to the north-west of the empire, we find Stoliczka observing it breeding on the Woollar lake in Cashmir; and across the range it is common, says Dr. Scully, in the plains of Eastern Turkestan in summer, though he never saw it in winter. Severtzoff says that it breeds in the south-eastern, south-western, and north-western districts of this country, ranging for that purpose as high as 4000 feet. In Central Asia it breeds at Lake Tsaidemin-nor, but, writes Przevalsky, does not occur in the Ussuri country. Middendorff does not record it from Siberia, nor Schreuck from Amoorland, so that we cannot accurately define its northernmost limit in Central Asia. In Palestine and in Asia Minor it is found at all seasons.

It is resident in some of the islands of the Mediterranean, but not common in Corsica. In Italy it is migratory in some parts of the country; for Dr. H. Giglioli affirms that it arrives in the neighbourhood of Pisa in April, and is then very common there. In Transylvania Messrs. Alston and Harvie Brown likewise testify to its being a migrant. In the south of Spain Col. Irby states that it is resident, being tolerably plentiful and generally distributed in all suitable localities. Mr. Saunders found it breeding near Seville; and Lord Lilford observed it in the Madrid neighbourhood. In France, Germany, Holland, and the British Isles it is a common bird, not breeding, however, in Shetland. It passes through Heligoland, according to Herr Gätke, in April and May, returning in August and September. It ranges as far north as the Central parts of Sweden, and is sometimes seen in Finland. The Faroe islands are also inhabited by it.

As regards the continent of Africa, it is resident, according to Favier, in the vicinity of Tangier; and in Lower Egypt and the Fayoom it is, says Capt. Shelley, plentiful in some districts; elsewhere in the country he did not meet with it, though he supposes that it is probably distributed throughout it. Von Heuglin writes that it is a bird of passage to North-east Africa and the Arabian coast, remaining in these regions from October till March, during which period it is common in Abyssinia, ranging as far south as the Gala district, and ascending the highlands to an altitude of 10,000 feet. This author likewise considers it probable that it breeds in the delta of the Nile. It ranges down the entire continent of South Africa, and has been obtained at Mozambique and in the islands of Mauritius and Réunion, and likewise in the Seychelles. Mr. F. Barratt shot it in the Transvaal and on the Orange River, and procured it in Pretoria in December. Layard says it is not uncommon in Cape Colony; and it has also been obtained in Damara Land.

On the west coast it inhabits Senegal, and has been obtained in Angola, Benguela, and the island of St. Thomas. Mr. Du Cane Godman notes it as a straggler to the island of Madeira, and considers that it has been introduced into St. Michael's (Azores), where it is found on the Lagoa do Fogo.

Habits.—In Eastern climes the Moorhen is, in common with most of the "Skulkers," found about jheels, tanks, swamps, overgrown paddy-fields, and the like. In Great Britain and Europe it affects alike the banks of rivers, the margins of brooks and streams, large and small, the reedy shores of lakes, and (in England) ornamental waters, artificial ponds, both in demesnes and farm-fields, as well as moors and marshes. Indeed it would be hard to say where it will not take up its abode as long as it is unmolested and there is sufficient food for its sustenance, and cover of suitable kind for it to nest in. It is, as most Englishmen know, one of the chief ornaments of all aquatic spots, whether it be in the park, where the shier Duck and Teal seldom venture to put in an appearance, but where the Moorhen swims fearlessly about or plumes itself on the green laurel-planted banks; or whether it be at the bottom of the pretty elm-bordered field, where it can be seen from the farmhouse door stalking warily along the hedge by the trickling brook, with its bright-red bill bobbing forward and its white tail jerking up at each step. In these and in the many other spots where it makes itself at home, the Moorhen must always be to the lover of nature a favourite bird. I have seen half a dozen together on a lonely upland pool in Wales at an elevation of 1000 feet above the sea, which looked a most uninviting spot, but where the Waterhen seemed quite as much at home as on the lowland brook. It often affects the vicinity of houses, being, in fact, by nature the reverse of shy, and accustomed to accommodate itself speedily to circumstances, as must be apparent to those who have seen it stalking unconcernedly about sedgy spots while a train dashes by within a few yards of it.

It swims very well, and passes much of its time afloat, though it does not progress rapidly on the water. It dives well, and when surprised or chased in a spot where it has but little room to escape, it possesses remarkable powers of concealing itself, such as forcing its way into a crevice beneath a bank, or sinking under water with its bill only projecting, to enable it to breathe, and usually hidden by some floating leaf or reed, where it will remain perfectly motionless until the danger it avoids is past. It likewise climbs with facility, and conceals itself among the branches of thick shrubs. Unless disturbed it rarely takes wing, though I have occasionally seen it of its own accord fly across rivers in Great Britain: its flight is laboured, and generally along the surface of the water. Its food is usually vegetable matter, and is mixed often with a considerable quantity of gravel, which, acted upon by the powerful muscles of its stomach, must rapidly perform the functions of digestion. It also consumes aquatic insects, larvæ, and fish, and when pressed by hunger becomes a perfectly omnivorous creature. Lord Lilford states that it will even kill and devour young birds of all sorts, and is consequently very destructive to game. Von Heuglin writes of it, as observed in Africa, that though it is sometimes met with in abundance, it is never seen collected in large flocks like Coots, and that it prefers the smaller sedge- and rush-covered streams that exist in upland moors to large open waters, although it is seen, now and then, on wild brooks which are lined with overhanging bushes. He noticed that the migration takes place at night, the birds following the course of water in their flight.

Dr. Scully observed that in the jheels in Turkestan they ran about with great ease on the fallen rushes floating on the surface of the water.

Nidification.—Regarding the breeding of the Waterhen in India, we gather from Mr. Hume's 'Nests and Eggs' (*l. c.*) that the season lasts from May till September, during which period they have two broods. In the plains they lay in July, August, and September. "The nest," writes Mr. Hume, "varies much in size and situation. Sometimes there is no nest at all, only a quantity of rush and rice bent down *in situ* to form a platform to support the eggs. Sometimes it is built up in the water like a Coot's. Often it is in some tuft or tussock of grass in a swamp, ditch, or pond. Occasionally it is wedged up several inches above the water in some tamarisk or babool-bush growing in a lake or jheel. In these latter cases (and I have seen two such) the nest is rather neater and more carefully built, composed of soft dry flag, with a well-formed shallow circular cavity, lined with somewhat firm rush. Generally the nest, when there is one, though firm enough (not nearly so firm, however, as a Coot's), is a rather ragged affair, the lower portion rotting in the water, and the upper part very carelessly put together of dry or half-dry straw, flags, rush, or reed, and not unfrequently an admixture of weeds." Nine is considered the full complement of eggs; and Mr. Hume finds that they are undistinguishable from specimens collected in Europe. The shell is described as "compact and firm, with little or no gloss. In shape the eggs are normally moderately broad, nearly perfect ovals, slightly compressed

towards one end ; but somewhat more pointed or elongated examples occur. The ground is a pale stone-colour, commonly tinted with pink when fresh. Some eggs are a very pale pinkish drab colour, others almost pale whity brown. They are more or less thickly sprinkled with spots, specks, and moderately-sized blotches of deep red, reddish brown, and purple, as the case may be." Sometimes the general appearance of the egg is streaked, the markings being often more or less grouped along irregular lines, running lengthways with the egg. The average size of twenty eggs is 1.62 by 1.21.

I have frequently found the nest of the Moorhen in England, and it is sometimes built and concealed in an interesting manner. On reference to my oological notes made in Essex in 1866-67, I find that the nesting-time in that part of England is at the latter end of April and beginning of May ; and I transcribe the following particulars from an old note-book with reference to the breeding of this bird in Pitsea Island :—" Most of the nests were built *in* water, though not in such deep water as the Coot's. Some rested on the mud left dry among the reeds ; these were not very deep or thick, and were slovenly constructed of green reeds and ' flags,' lined with the blades of dry reeds and also of green ones ; they were fixed between reeds growing out of the mud, and none were nearer to the shore than a few yards. In the first nest I found there was but one fresh egg ; this was standing in water of a few inches deep, and was built up in pile-fashion from the bottom, and kept in its place by the standing reeds ; the lining of the nest was made up of bits of the blade of the reed. The egg was of a stone-yellow ground-colour, spotted evenly throughout with rather small spots of lilac-red and brownish red. Dimensions 1.55 by 1.21 inch. A second nest was built up in the same fashion, but a few blades of the supporting reeds were bent down over it, so that it was slightly concealed. There were four eggs, slightly incubated, in this one, longer in shape than the above-mentioned, and of a yellower ground-colour, and with lighter-coloured spots mingled with a few dashes of lilac. In another nest similarly constructed there were two fresh eggs, which differed totally from both the aforesaid ; they were blunt ovals, similarly shaped at each end, and of a buff ground-colour, blotched with tolerably large blotches of lilac and a few blots of light red and slaty blue : they measured 1.67 by 1.21 inch. A fourth nest was built in water on the roots of reeds, and supported by their stalks all round ; it was raised up like a Coot's, with perpendicular sides, to a height of 8 or 9 inches from the surface of the water : the body of the nest was constructed of reed-stalks, lined with blades cut into lengths of 3 or 4 inches. The green blades of the supporting reeds were bent down over the nest, and woven in among one another in a very clever manner, forming the framework of a complete dome over the nest. There were eleven eggs in this nest, differing in a very marked manner. Three or four were small and stumpy in form, with a whitish-yellow ground-colour, spotted sparingly throughout with blue, lilac-red, and brownish red ; they measured 1.45 by 1.08 inch : the rest were somewhat pyriform, round at the large end, and rather tapering at the small, with a reddish-yellow ground-colour, marked with very irregular blotches of dark red-brown and dark slate-colour, mingled with smaller spots of the same colour ; they measured 1.76 by 1.26. These two types were evidently the produce of two birds."

The Moorhen sometimes builds in trees ; and the late Mr. E. Newman, who was a diligent oologist, mentions having seen the nest high up in spruce firs near the bole, and also out at the end of a branch, while at other times he found it on horizontal boughs or on the top of pollard willows.

Subgenus ERYTHRA.

Bill longer than in *Gallinula*; the culmen scarcely prolonged upon the forehead; 2nd quill shorter than the 3rd. Tarsus proportionately longer, equal to the middle toe without its claw.

ERYTHRA PHÆNICURA.

(THE WHITE-BREASTED WATERHEN.)

Rallus phœnicurus, Forster, Ind. Zool. p. 19, pl. 9 (1781), ex Ceylon; Gmelin, ed. Syst. Nat. i. p. 715 (1788).

Gallinula phœnicura (Forst.), Lath. Ind. Orn. ii. p. 770 (1790); Kelaart, Prodrum, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 720 (1864); Schlegel, Mus. Pays-Bas, *Ralli*, p. 41 (1865); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 476; Hume, Str. Feath. 1873, p. 424, et 1874, p. 300; Legge, Ibis, 1875, p. 276; Hume, Nests and Eggs, iii. p. 599 (1875); Butler & Hume, Str. Feath. 1876, p. 21; Fairbank, *t. c.* p. 263; Butler, *ibid.* 1877, p. 224; Davison & Hume, *ibid.* 1878 (B. of Tenass.), p. 466; Ball, *ibid.* viii. p. 229.

Gallinula javanica, Horsf. Trans. Linn. Soc. xiii. p. 136 (1821); Sykes, Cat. B. Deccan, P. Z. S. 1832, p. 164.

Porzana phœnicura (Penn.), Blyth, Cat. B. Mus. A. S. B. p. 284 (1849); *id.* Ibis, 1867, p. 171; Hume, Str. Feath. 1873, p. 251.

Erythra phœnicura (Penn.), Reich. Syst. Av. Nat. p. 21 (1852); Walden, Trans. Z. S. 1872, viii. p. 94; Salvadori, Uccelli di Born. p. 340 (1874); Walden, Trans. Zool. Soc. 1875, ix. p. 229; Davidson & Wender, Str. Feath. 1878, vii. p. 90; Cripps, *t. c.* p. 306; Hume, *ibid.* 1879 (B. of Malay Penin.), p. 70; *id.* *t. c.* (List. Ind. Birds), p. 113.

Das rothgeschwanzte Wasserhuhn, Forster; *Red-tailed Gallinule*, Kelaart. *Burok-Burok*, Borneo (Mottley); *Kaloo-givet*, Arrakan; *Roa Roa*, Malay; *Eri-Bombo*, Java (Blyth); *Meres*, Celebes (Meyer); *Dawak*, *Dahak*, Hind.; *Boli-kodi*, Telugu; *Kureyn* of the Gonds; *Kurayi*, Sindh (Jerdon); *Tannir koli*, Ceylonese Tamils; also *Kanung-koli*.

Korowaka, Sinhalese, from its call.

Adult male and female. Length 12·0 inches; wing 6·1 to 6·2; tail 2·4; tarsus 2·1 to 2·25; bare tibia 1·0; mid toe and claw 2·5 to 2·6; bill to gape 1·5.

Iris varying from brown to brownish red; bill green, culmen dark, and the shield or base of culmen red; tibia, knees, and toes yellowish olivaceous, the tarsus washed with olive-brown; claws olive-brown.

Head, upper surface, sides of chest and breast, wings, and tail deep slaty olive-green, passing somewhat into rusty olive on the rump, and suffused with a slaty hue on the sides of the chest and breast; forehead, face, fore neck, down the centre of chest and breast white, passing over the eye, and separated by a black border from the olive-green, which border is variable in width and blends into the upper colours; 1st primary with a white edge; sides of rump, tibia-coverts, and under tail-coverts light chestnut, fading into rufescent on the abdomen; thighs rufescent white in front and olive-brown behind.

The width of the white frontal band depends on age; in fully adult birds it is about 0·35 inch in breadth. A specimen in abraded plumage in my collection has the feathers of the back tipped with grey; and Mr. Holdsworth calls attention to a similar specimen.

Young. When first hatched the chick is covered with black down. After leaving the nest, and following the parent, the back becomes edged with pale brownish; a stripe on each side of the chin and the sides of the belly whitish; wing-coverts and breast with faint light bars; sides of the rump and under tail-coverts rufescent.

An example now before me, partly feathered and partly in down, has the ear-coverts greyish white, and the face and lores black, mingled with a few whitish feathers, one or two of which are also present above the eye and on the forehead; the centre of the chin is black; but on either side the throat is white, and the feathers of the fore neck are whitish, tipped with slaty, which spreads over the chest, and then gives way to white on the centre of the breast.

Iris brown; bill black; legs and feet dusky olive-brown.

Obs. As will be seen from a perusal of the above description of the young, the frontal band and white face are wanting in youth; and it is evident that the first-year examples vary considerably in the extent to which these characters are acquired: in some there is not a trace of white on the forehead; in others there is a narrow frontal band and no white above the eye; in some, again, there is a narrow white supercilium; in others the face and forehead are concolorous with the head, but with a few white feathers here and there, showing that eventually the parts in question will become white. This variableness has given rise to the opinion that there may be two species; but such is not the case. Jerdon omits mention of the white face and forehead, and evidently took his description from an immature example. Mr. Holdsworth notices this fact, and speaks of a specimen in the British Museum from the "Indian Archipelago," in which the white is confined to the underparts, the forehead and face in a line with the lower mandible being blackish. I have carefully examined this bird, and find that there are whitish and white-tipped feathers on the face, and it is consequently an immature bird. The forehead has no appearance of immediate change; but some examples, as I have already stated, have the face white and the forehead black, the latter probably not changing until the third moult. The measurements of the bird in question are similar to those of Indian examples; they are:—wing 6·6 inches; tail 2·8; tarsus 2·3; bill to gape 1·5. A series of skins I have examined from India measure as follows:—wing 5·6 to 6·7 inches; tarsus 2·1 to 2·3; bill to gape 1·3 to 1·4. Adult specimens from the mainland correspond in coloration exactly with Ceylonese, with, of course, variations in individuals as to the breadth of the white frontal band, as in insular birds.

Mr. Hume notices some interesting points of difference between Andaman and Nicobar examples and Indian. These consist in the forehead having sometimes much more white than is ever seen in the latter, this colour extending back as much as 1 inch from the bill, whereas on the under surface there is less white, and the lower belly, vent, and tibial plumes are darker—that is, chestnut-coloured instead of pale rufescent. These characters seem to be acquired with age, some specimens corresponding with Indian birds. The wing in four female examples varied from 6·0 to 6·5 inches. Examples from Acheen, in Western Sumatra, resemble, says Mr. Hume, Indian, and not Nicobar birds.

I have compared the following specimens in the national collection with some from Ceylon:—

(Java) ♂. Identical in hue of upper surface, with the same amount of white on the forehead, face, and under surface: wing 6·0; tarsus 2·1.

(Celebes) (a) ♀. Same amount of white on forehead and face; upper surface slightly differing; more greenish on the rump: wing 5·8 inches; tarsus 1·95. (b) Similar to Ceylonese: wing 6·7 inches; tarsus 2·2. (c) Immature, in the act of acquiring the white forehead; the centre part white, and the sides dark.

(Banjermassing, Borneo.) Similar to Ceylonese: wing 5·7 inches.

(Timor.) Immature: face and forehead dark, spotted with white. This is apparently the *Gallinula leucomelana* of S. Müller; but it does not appear to be separable from true *E. phœnicura*.

Lastly, I must remark that the White-breasted Waterhen varies, like the Common Crow, considerably in size of body, though there is not perhaps a corresponding shortness of wing. This is observable even when they are seen at large; and Mr. Bligh lately writes me of an example (male), lately procured, which was so small as to lead him to think that there must be two species in Ceylon.

Distribution.—This Waterhen is universally distributed throughout the low country from Jaffna to Dondra Head, and from Colombo across to Batticaloa; and is nowhere more common than about Colombo, where it is resident all round the lake, breeding freely on its shores. In the western and south-western portions of the island, which are well watered by both rivers and small streams and brooks, and abundantly covered with paddy-fields, it is exceedingly common, and is met with almost everywhere where there is water. In the eastern and western districts it is chiefly confined to large sheets of water and the numerous village tanks, the

only source of irrigation at the disposal of the inhabitants living in these forest-regions. It affects the shores of moderately brackish lagoons, which are surrounded by mangroves and other jungle, such as the Amblangoda, Kogalla, and Panadure lakes; but it is not found on the salt-lagoons of the Eastern Province. It extends into the hills to a moderate elevation, keeping to the well-watered valleys in the Kandy district; and it may be frequently observed about the terraced paddy-fields of the Kandyans. I have known it occur in this part of the Central Province up to 2000 feet elevation. In Uva, however, it ascends much higher, frequenting the country lying between Badulla and Fort Macdonald, so that it must reach an altitude of more than 3000 feet in this district.

It is very abundant in suitable localities throughout peninsular India, not ranging, however, in any great numbers towards the north-west of the empire, where its place is taken by the preceding species. It is common in the Carnatic, and, according to Messrs. Davidson and Wender, it is likewise so in the Deccan; near Mahabaleshwar it is recorded by the Rev. Dr. Fairbank from the Koina River. It is not uncommon about Bombay. Further north, on this side, it becomes rarer. Captain Butler says it is tolerably common at Milana; but in Guzerat and about Mt. Aboo generally it is rare. Mr. Hume writes, notwithstanding, that he has seen many specimens from Mt. Aboo, but none from Northern Guzerat or Judhpoor; and in Sindh it occurs only along the canals; in Cutch and Kattiawar it is also found, but not commonly. The province of Sindh appears to be its limit in this direction. Turning to the east I observe that Mr. Blewitt found it breeding in Saugor, Raipur, and Sambalpur; and Mr. Ball remarks that it is occasionally met with in Chota Nagpur, afterwards instancing in his list Lohardugga, Sirguja, Raipur, Nowagarh, and Karial as the localities where he observed it. Mr. Cripps writes that it is very common in Furreedpore; and Mr. Hume notes that it is from time to time brought into the Calcutta market, so that it cannot but be plentiful in the neighbourhood of the capital. In Upper Pegu Mr. Oates found it common; and Captain Wardlaw Ramsay procured it at Tonghoo. In the Province of Tenasserim it is pretty common in suitable localities, being recorded by Messrs. Hume and Davison from Paphoon, Wimping, Kanee, Pabyouk, Amherst, Tavoy, and Bankasoon. In the Malay Peninsula it was procured at Malacca by Eyton.

In the Andaman and Nicobar Islands it is found everywhere in suitable localities; and Mr. Davison found it common about creeks in Acheen (N.W. Sumatra); it has likewise been obtained in Sumatra by S. Müller, and recently in the Lampoung district by Mr. Buxton. In Java it is not uncommon, and has been procured there by Horsfield, Boie, and Diard; the same may be said of Borneo, where it has been recorded from Sarawak, Banjermassing, Brunei, and other localities. It likewise inhabits the adjoining island of Labuan, and it has been procured in the island of Banca, between Borneo and Sumatra. In Celebes it has been obtained in various localities by several travellers, and recently by Herr Meyer at Menado and Kakas. I have above recorded a specimen from Timor which I believe to belong to this species. In the Philippines Von Martens procured it at Zamboanga, in the island of Mindanao. Turning north to the eastern coasts of the mainland we find it inhabiting South China and Formosa, according to Père David and Swinhoe; but we have no record of its ranging into the northern parts of the Celestial empire.

Habits.—The White-breasted Waterhen, which is, in a great measure, the Ceylonese representative of the Moorhen, like it frequents the borders of tanks, swamps, morasses, wet paddy-fields, brooks, ponds, and, in fact, any spot containing fresh water of permanent duration. It is much more of a "skulker," however, than its European relative, and is capable of frequenting the margins of some pool or pond close to one's house for months without often giving one a chance of seeing it, although its extraordinary and unbird-like cries do not fail every morning and evening loudly to proclaim its whereabouts. It prefers situations where the banks are overhung with bushes or densely matted with screw-pines (its favourite retreat) to reedy sedgy spots, although, where such exist at the margins of large tanks or swamps, it does not refuse to affect them. In cultivated country among the villages of the interior it is frequently seen away from water, frequenting the vicinity of thick hedges and damp scrub, into which it quickly darts when it espies the sportsman, although it does not seem to mind the presence of natives in its vicinity. It runs with great speed, and, according to my observation, rarely ever takes wing, and very seldom enters the water; in fact it has more the habits and nature of a Rail than a true Waterhen. When roused out of a screw-pine or other tree in which it may have been perched, it will fly a short distance and with moderate speed, but it quickly drops to the bank and runs under cover.

I have nowhere seen it so tame as on the borders of the Slave-Island lake. Here a pair frequented the vicinity of my compound, which extended from the bungalow on the "Galle face" to the edge of the water, and passed their time between feeding in a little sedgy inlet and lurking beneath some screw-pines (*Pandanus*) which grew in the adjoining grounds. In the mornings they frequently ventured on to the open grass at the end of the garden; and one evening, after a very heavy monsoon shower, they perched on the top of a bamboo fence for a considerable time, and plumed themselves like Sparrows. In this locality I had ample opportunity of listening to the extraordinary cries for which this species is celebrated. Wonderful as they are, and most unnatural as proceeding from the throat of a bird, I cannot but admit that they are to my ears very interesting from the bare fact of their being so remarkable. It cannot be denied that they would startle a new arrival in the colony, if uttered beneath his windows on the first moonlight night that he was destined to repose in one of the beautiful bungalows in Colpetty; and he might probably spring to the window and anxiously inquire who was being strangled! Yet as soon as he knew that they were merely the outcome of the vocal powers of two timid little Waterhens rejoicing in the cool of the tropical night, his alarm would be turned into pleasure at listening to such strange bird-notes. It would be difficult to give to my European readers an adequate idea of the sounds by attempting to syllabize them; but they commence somewhat with the syllables *quaor, quaor, quaor*, slowly pronounced at first, and then accelerated and breaking into *korowak wok, korowak wok-wok, korowok wok*; this is changed into a very deep *quoor, quoor, qu-oor*, ending slowly and with apparent effort, as if the bird's throat had suddenly become very sore with its exertions.

A writer in India, Mr. E. H. Aitken, takes a less favourable view of the matter, and, in his notes to Mr. Hume for 'Nests and Eggs,' says, "In September 1878 I was living at Bombay in a house surrounded by very low-lying fields, which were under water nearly all the monsoon, and, of course, became the resort of various water-birds. Among them this year were half a dozen of this *Gallinula*, which very soon made their presence known by their awful cries. I cannot understand Dr. Jerdon dismissing the cry of this bird, if he ever heard it during the breeding-season, with the words 'has a loud call.' Any thing more unearthly proceeding from the throat of a bird I never heard. It began with loud harsh roars, which might have been elicited from a bear by roasting it slowly over a large fire, then suddenly changed to a clear note, repeated like the coo of a Dove."

Of their habits he writes, "Often in the morning two or three of the birds might be seen in some little open space fighting like young cock-chickens. When flushed they seldom flew far, seeming to trust more to their legs than their wings." Jerdon notices that it runs with great rapidity and erect tail, and climbs with facility through the thick shrubs and reeds, from which it is dislodged with difficulty. In the Andamans Mr. Davison found it in secondary jungle, sugarcane- and paddy-fields, along the edges of mangrove-swamps, and anywhere where there was cover.

Blyth remarks in a note on this species as follows:—"Its blood is accounted a valuable remedy by the natives of Bengal, as is also that of *Casarca rutila* (the Ruddy Sheldrake); hence in the bazar the dealers want a higher price for *Porzana phenicura* than for other birds of its size."

The food of the White-breasted Waterhen consists of grain, seeds of aquatic plants, and other vegetable matter, and also insects. Herr Meyer notices that it scratches in the ground with its feet for its food like a fowl.

Nidification.—Regarding the nesting of this species I cannot do better than transcribe here the notes I sent some years ago to Mr. Hume on the subject. They are as follows:—"I have found the eggs of *E. phenicura* in the Western Province from the beginning of June to the latter part of September. On the edge of the Colombo Lake a number of nests taken were constructed in a variety of situations: some on the ground, of reeds and grass-stalks; others on tussocks surrounded by water, and made of the same materials laid on the top of the tussock, the stalks of which were beaten down for a foundation; others on the branches of the screw-pine, one of these being at a height of 10 feet from the ground. These last were flat and shallow, and made of the leaves of aquatic plants and blades of rushes. As a rule the top of the nest is almost flat, without any hollow for the reception of the eggs, and the materials of the interior are generally laid across each other, somewhat regularly. One nest, found on the branches of a *Pandanus*, was constructed entirely of the dead stems of a creeper with which this tree was covered. The same remarkable difference exists in

eggs of what appear to be the same clutch in this species as in those of *Gallinula chloropus*; some of them I have seen long and pointed at both ends, some oval, and others stumpy and pointed at the smaller end, being somewhat pyriform in shape.

"The ground-colour is yellowish grey or reddish white; some are marked all over the surface and in a zone round the obtuse end with yellowish-brown and light-red spots and blotches over others of bluish and greenish grey, while others are marked more sparingly with large blotches of the same hues. I have never found more than four eggs in one nest. Two specimens from the same nest measure respectively 1.65 by 1.23 and 1.57 by 1.18 inch; others I have range from 1.5 to 1.52 in length, and from 1.1 to 1.25 in breadth."

To this I would add that the breeding-season in the Western Province is in May, June, and July; but at Kurunegala I have obtained young chicks in December, by which I infer that two broods are reared in the year.

In India it breeds from July until September, nesting sometimes in trees, as in Ceylon. Mr. Aitken describes the position of a nest as in the top of a date-palm, the outer structure appearing to consist of an old Crow's nest; the old bird made its way up to it after he had replaced the eggs, "not flying, but running up the rough bark of the date like a ladder." The eggs of this bird are described by Mr. Hume as being of a "dull stone-coloured ground, with rather bright slightly brownish-red spots, specks, and streaks, most numerous towards the large end, where, besides these, there are a number of faint inky-purple spots and streaks, which appear to underlie the brighter markings."

Mr. Oates recently, writing on Burmese birds, says this Waterhen *always* makes "its nest in trees, at heights not below 10 feet. It selects a creeper-grown tree, either in paddy-land or on the outside of forest. . . . A bamboo bush, the leaves of which are well entangled, is also much affected. The nest is merely an irregular platform of dead and green leaves resting on a few twigs." The number of eggs found by him was four in each nest.

Genus GALLICREX.

Bill longer than in *Erythra*; the base of the culmen prolonged back upon the forehead more than in that genus, and developed, in the male, at breeding-time, into a fleshy crest or comb. Wings with the 2nd and 3rd quills subequal and longest, and the 1st shorter than the 6th. Tertiaries nearly equal to the primaries. Tail short and rounded. Legs long; tibia bare considerably above the knee. Tarsus equal to the middle toe; toes slender, the outer exceeding the inner; hind toe moderately long.

GALLICREX CINEREA.

(THE WATERCOCK.)

Fulica cinerea, Gm. ed. Syst. Nat. i. p. 702 (1788).

Gallinula cristata, Lath. Ind. Orn. ii. p. 773 (1790); Kelaart, Prodrum, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Schlegel, Mus. Pays-Bas, *Ralli*, p. 39 (1865).

Gallinula lugubris, Horsf. Tr. Linn. Soc. xiii. p. 195, ♂, Java (1821).

Gallinula gularis, Horsf. l. c. ♀.

Rallus rufescens, Vieill. Jerdon, Madras J. L. & Sc. xii. p. 205 (1840).

Gallix cristatus (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 283 (1849); Jerdon, B. of Ind. iii. p. 716 (1864); Holdsw. P. Z. S. 1872, p. 475; Blanford, Str. Feath. 1877, p. 247.

Gallix cristata (Lath.), Blyth, Ibis, 1867, p. 171; Swinhoe, P. Z. S. 1871, p. 414; Adam, Str. Feath. 1873, p. 397; Salvadori, Ucc. di. Born. p. 340 (1874); Legge, Ibis, 1874, p. 31, et 1875, p. 403; Swinhoe, ibid. 1875, p. 134; Sharpe, ibid. 1879, p. 271.

Gallix cinereus (Gm.), Hume, Str. Feath. 1874, p. 300; id. Nests and Eggs, iii. p. 596 (1875); Hume & Oates, Str. Feath. 1875, p. 187; Hume & Davison, Str. Feath. 1878, p. 466 (B. of Tenass.); Ball, ibid. vii. p. 229; Cripps, t. c. p. 305; Hume, ibid. 1879, pp. 70, 113.

Gallix cinerea (Gm.), Walden, Trans. Zool. Soc. 1875, ix. p. 229; Oates, Str. Feath. 1877, p. 165; David & Oustalet, Ois. de la Chine, p. 484 (1877).

Crested Gallinule, Lath.; *Cock of the Reeds* (Swinhoe); "*Paddy-fowl*," Sportsmen in Ceylon. *Kora*, Hind., also *Kongra* (Jerdon); *Bontod Bureng*, Java (Blyth); *Hung-kwan*, lit. "Red Cap," Chinese.

Kittala, Sinhalese in North; *Willi-kukulu*, in South; *Tannirkoli*, Tamil.

Adult male (India: Brit. Museum). Wing 8·3 inches; tail 3·3; tarsus 2·6; middle toe 2·8, its claw (straight) 0·5; hind toe 1·3; bill to gape 1·36.

"Length 16·75 inches, Tenasserim" (*Davison*); "17·0, Upper Pegu" (*Oates*).

"Iris hazel-brown; eyelids smoky plumbeous; frontal shield and base of upper mandible deep dull red; horn pinkish; the bill, with the above exception, is yellow, there being a red spot at the base of the lower mandible; inside of mouth flesh-colour; legs plumbeous green; claws horny" (*Oates*).

In dried specimens the horn and shield appear dull red. The former rises up behind the shield, is pointed at the apex, and measures sometimes an inch in length.

Breeding-plumage (Amoy: May). Head, neck, throat, and underparts dull black; the feathers of the head, hind neck, and back with bluish-ashy margins, and those of the throat and under surface tipped with ashy grey; wings brown, the lesser coverts edged like the back, and the tertials and greater coverts edged with fulvous or yellowish brown; back and rump brown, with tawny edgings to the feathers; edge of the wing, outer web of first primary, and first winglet-feathers whitish; tail brown, the feathers edged similarly to the tertials; under tail-coverts buff-white, barred with blackish; under wing-coverts brown, edged with yellowish white; frontal plate and fleshy crest red.

Indian examples correspond with the above; but those in the national collection which I have examined are not in such perfect plumage, and I have therefore described a Chinese example.

An example in the national collection from Manilla shows the changing of the plumage from the breeding to the non-breeding dress, which is that of the female. The neck and under surface are whitish, barred with narrow

cross marks of dark slaty, and on the throat and fore neck some of the blackish nuptial feathers remain; the hind neck, back, and scapulars are chocolate-brown, passing with a fulvous hue into the buff of the margins of the feathers.

Blyth states that the hue of the breeding-season is assumed by a change of colouring in the non-breeding feathers, the caruncle or horn rising at the same time from the pointed frontal shield, into which it shrinks after breeding is over.

Female (Ceylon). Length 13·3 to 14·2 inches; wing 7·0 to 7·4; tail 2·8 to 3·1; tarsus 2·5 to 2·8; middle toe and claw 2·85 to 3·15; bill to gape 1·3 to 1·4.

Iris pale brown or yellow-brown; bill, upper mandible dark olive, the base near the forehead yellow or sometimes reddish, the lower mandible yellowish fleshy, with the gonyes red in some; legs and feet greyish olive-green, the joints greenish yellow.

Top of the head, down the centre of hind neck, upper surface, inner wing-coverts, and tail scapula-brown, palest on the hind neck, and changing gradually on the outer wing-coverts to bluish slaty; the head almost uniform brown; the remaining portions deeply margined, except on the lower back, with tawny fulvous; margins of the greater coverts mottled with the ground-colour of the feathers; quills cinereous brown, slaty beneath the 1st primary, and along the front of the wing white; chin, throat, and abdomen whitish, blending into the brownish fulvous or tawny of the face, supercilium, fore neck, and underparts; neck, breast, flanks, and under tail-coverts crossed with wavy bars of cinereous brown, indistinct on the body, and darker and well-defined on the under tail-coverts; posterior portion of thighs brownish; under wing-coverts slaty, tipped with white. Some examples have the abdomen almost concolorous with the breast, and lightly barred.

Young. I have not succeeded in examining any young examples, and never procured any in Ceylon. The plumage in the immature stage has not, to my knowledge, been described, but it probably differs little from that of the female.

Obs. A comparison of Ceylonese female specimens of this bird with a series from India, Malaya, and China shows that it varies scarcely at all throughout its wide range, either in plumage or in size. The wings of those I have measured from Malaya and India vary from 7·2 to 7·5 inches.

Distribution.—The Waterecock is a moderately common bird in Ceylon, but it is so skulking in its habits that it is not observed as often as it otherwise would be. Layard speaks of it as being “common in the south about Matara, frequenting the sedges” there; and I therefore conclude that he only noticed it in this district. In the neighbourhood of Colombo it came under Mr. Holdsworth’s observation, for he remarks that it is common there; and, as a matter of fact, it is perhaps more plentiful round Colombo than in any other part of the Western Province, except perhaps in the extensive paddy-lands near the Bolgodde lake. I have seen it at Marandahn, Borella, and near Grand Pass, all within a radius of three miles of the town; and at Kaduwella and Kotte it is just as often met with. It has mostly come under my notice in these parts during the north-east monsoon (at Galle I never saw it between April and October); and there may be an internal migration towards the coast from the tank districts in the North-west Province, where it is abundant in certain places. Mr. Parker informs me that he has counted about seventy in sight at the same time round a tank not far from Wariyapola, in the Kurunegala district. It inhabits, as a rule, all the tanks in the northern part of the island; and I have procured it in a swamp close to the shore near Trineomalie, where it is by no means uncommon. It is found in the Jaffna peninsula, where Mr. F. Gordon, of the Oriental Bank, has procured it. It inhabits the tank districts in the Eastern Province; and I have seen it in suitable localities in the country to the north of Hambantota and also towards Yāla. I never obtained a male bird, but procured plenty of females, and saw them in other collections while in the island, none of which contained, however, any examples of the other sex: this is noteworthy. As to its distribution in the mainland, it may be said to be local, and, further, that it does not extend into the drier portions of the north-west of the empire. Mr. Hume says of it:—“The Waterecock, so far as our Indian empire is concerned, is, I think, restricted to tracts where the rainfall is not less than 40 inches, and where night frosts are unknown.

“It is common on the western coast of the peninsula, in the eastern portions of the Central Provinces, and in the neighbourhood of the Mahanuddy, throughout Lower Bengal . . . but it is almost unknown in the

drier portions of the centre of the peninsula, Behar, and the North-west Provinces (except in the sub-Himalayan zone), the Punjab, Rajpootana, and Sindh." Mr. Blanford, however, notes its occurrence in Sindh, and considers it to be a straggler to that Province. Mr. Adam only saw it once at the Sambhur Lake, and that is the sole record in 'Stray Feathers' of its occurrence in that part of India. Jerdon writes that it is far from common in Southern India, as also in Central India, but says that it is the reverse in Lower Bengal, and still more plentiful in Sylhet, Chittagong, and Burmah. Mr. Ball notes it from the Rajmehar hills and Manbhum; and Mr. Cripps says that it is very common during the rains (though absent in the cold weather) all over the country in Furreedpore, wherever there is standing paddy. He likewise speaks of it breeding in the Dacca and Tipperah districts.

Mr. Oates records it as common in Upper Pegu. Mr. Hume likewise records it from Arakan and Lower Pegu; but I observe that it did not come under Dr. Armstrong's notice in his exploration of the Irrawaddy Delta. Captain Wardlaw Ramsay procured it at Tonghoo; and Messrs. Hume and Davison only observed it in the central and northern portions of Tenasserim, noting it from Thatone, Attaran River, Tavoy, and Shymotee. The latter gentleman met with it commonly in the Andamans about Aberdeen, but did not see it at all in the Nicobars. From the Malay peninsula there is a specimen in the Calcutta Museum recorded by Blyth, and no doubt it is common there.

It is found in Java, where it was procured by S. Müller, Kuhl, Von Hasselt, and Diard. In Borneo it is probably pretty evenly distributed; for Mr. Mottley procured it in the extreme south at Banjermassing, and recently Mr. Treacher obtained it in the north-west on the Lâwas river. From Borneo it extends (probably through Palawan) to the Philippines, where it is, however, only known as inhabiting Luzon, specimens having been procured at Manilla by Messrs. Cuming and Dussumier. In the island of Formosa Swinhoe obtained it; and on the mainland of China it is found as far north as Cheefoo, extending westward to Szechuen and, according to David, as far north as the basin of the Yangtse. It inhabits, in all probability, the intervening regions of Cochin China and Siam, in common with other species found in the Malay Peninsula and China.

Habits.—The Kora, as it is called in India, affects long grass, standing corn or paddy, sedgy, reedy marshes, and such-like damp situations which afford it complete cover. Although in wild districts, where it is very plentiful, it may be seen in the open, where its haunt is guarded by a belt of impenetrable jungle or scrub, yet in cultivated and inhabited districts it affects the greatest concealment in the daytime, and is, I imagine, entirely nocturnal as regards its manner of feeding and habit of moving about. I have never once seen it in paddy-fields or grassy swamps on the move, but have invariably put it up when firing at some other bird. It then flies swiftly and takes sometimes a long stretch on the wing, carrying its legs straight out behind it. I have generally found it among rather thick, moderately high rushes; but it frequently resorts to paddy-fields, and is consequently called "Paddy-fowl" by sportsmen, who flush it when Snipe-shooting, and generally do not let it escape, as its flesh is very good eating.

It has never been my good fortune to hear its remarkable note, which, I apprehend, is uttered chiefly in the breeding-season. Mr. Oates says it has a loud, deep, booming call, and that it is crepuscular in its habits. "Its stomach," he remarks, "is extremely muscular; one I examined contained green rice, rice-leaves, and a small shell."

Mr. Davison writes of it:—"The Watercock found at the Andamans belies its name by never (as far as I have observed) being found near water. The only places in which I have observed it are the sugarcane-fields; in these it is not uncommon, especially about Aberdeen. During the day it keeps under shelter; but in the morning and evening comes into the open to feed, seldom, however, wandering far from cover, to which it retreats on the slightest alarm." In Tenasserim the same writer states that these birds were most common about rice-fields in the mornings and evenings.

I have found its food to consist of paddy- and grass-seeds, usually mixed with aquatic insects. Jerdon has some interesting notes on its habits, which I transcribe as follows:—"It affects concealment much more than the Waterhens, running with activity through the tangled grass or paddy, or on the surface of weedy tanks. It feeds on rice and other grains, or shoots of various water-plants, and also on small mollusks and insects. It is a very noisy bird, and its loud, sonorous, booming cries, especially during the breeding-season, must be familiar to many.

"Taylor, in his 'Topography of Dacca,' states that the voice of this bird, before engaging in combat, is peculiar; the throat swells out and emits a deep hollow sound, which is continued for several seconds, and is suddenly followed by a shrill, vibratory cry like that of the Trumpeter Birds (*Psophia*) of South America. Like many of the Rails it is partially nocturnal in its habits. The male birds are said to fight furiously, and are much prized by the natives, who keep them for that purpose, especially in Dacca, Sylhet, &c. It is excellent eating, and according to a writer in the 'Indian Sporting Review,' 'the flesh, feather, and courage of the Kora are all game.'"

Mr. Cripps, however, states (Str. Feath. ii. p. 531) that they are kept rather for the purpose of catching wild ones. He writes:—"When a wild one is heard calling, the tame bird being let loose finds him out, and grappling keeps hold until the owner comes up and catches both. I know two zemindars in the Tipperah who are enthusiasts at this."

The same writer likewise affirms that the natives of the Dacca and Tipperah districts often *themselves* hatch the eggs of this species. "The *modus operandi*," he observes, "is to take half a cocoanut-shell, put a layer of cotton in, on top of which they place the egg and fill up with cotton; the shell is then placed on the man's stomach and tied on with a long strip of cloth, which is wound round his body. Until the egg is hatched the man never bathes."

Nidification.—The Watercock breeds in the south of Ceylon in July and August, nesting in wild localities in the interior. I had two eggs brought to me by a native in the Hinedun Pattuwa on the 16th of August, 1872, as belonging to the "*Willi-kukulu*," and I afterwards identified them as such. They are small for the size of the bird, narrow ovals in shape, very nearly the same at both ends, and very handsome. The ground-colour is creamy white, marked at the large end with brownish red, mixed with a few specks of bluish grey. In one egg the brownish red is in the form of blotches running in the direction of the axis, and confluent all over the end, forming a large cap of an almost uniform colour; in the other the coloration is in the form of a broad zone, having a very small pale centre. The smaller end is quite devoid of markings. They measure 1.62 by 1.13 inch, and 1.57 by 1.13 respectively.

Mr. MacVicar found a nest at Bolgodde in long grass; it was built of rushes and grass, and was a massive structure. There were two eggs only in the nest, of a reddish-white ground-colour, freckled over the whole surface with light red and reddish brown over small spots of faded lilac or bluish grey; at the large end the markings were confluent, especially in one specimen. They measured 1.52 by 1.1 and 1.58 by 1.14 inch respectively.

In Lower Bengal and in Burmah it breeds in July and August. Mr. Hume describes nests found in the former region as sometimes large Coot-like structures, made of flags and rice-straw, and placed in the middle of a dense tangled mass of reeds, rush, and water-weeds; and at other times comparatively slight nests of fine rush and grass on the floating leaves of Lotus and Singhara (*Trapa bispinosa*).

The ground-colour of the eggs is noted as pale yellowish or stone-colour, sometimes with a faint greenish tinge, occasionally almost white, thickly blotched and streaked with brownish red or slightly reddish brown and purple, or even deep red. As in the specimens above noticed, the markings are confluent at the obtuse end in most; but in some the whole surface is freckled. The smallest of Mr. Hume's series measures 1.58 by 1.12 inch; but he gives the average of a dozen as 1.7 by 1.27 inch.

Genus PORPHYRIO.

Bill large, rather short, very high at the base, much compressed or wedge-shaped; the culmen curved and produced back to the crown, covering the forehead with a shield. Nostrils oval, oblique, placed well forward and near the culmen; gonys deep and ascending. Wings rather long; the 2nd, 3rd, and 4th quills subequal and longest, and the 1st shorter than the 6th. Tail short, about equal to the tarsus. Legs long; tibia bare for more than the length of the hind toe. Tarsus shielded before and behind with broad rectangular scales. Toes very long, bordered by a narrow membrane, the middle one exceeding the tarsus, the outer much longer than the inner; claws stout and straight.

Tongue large, fleshy, and horny at the tip.

PORPHYRIO POLIOCEPHALUS.

(THE INDIAN BLUE COOT.)

Gallinula poliocephala, Lath. Ind. Orn. Suppl. p. 58 (1791).

Porphyrio poliocephalus (Lath.), Vieill. Nouv. Dict. Hist. Nat. tom. xxviii. p. 39 (1819); Gray, Gen. B. iii. p. 598 (1849); Blyth, Cat. B. Mus. A. S. B. p. 283 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 713 (1864); Blyth, Ibis, 1867, p. 171; Holdsw. P. Z. S. 1872, p. 475; Legge, Ibis, 1874, p. 31, et 1875, p. 403; Blyth, B. Burmah, p. 161 (1875); Butler & Hume, Str. Feath. 1876, p. 20; Davison & Hume, ibid. 1878 (B. of Tenass.), p. 464; D. Elliot, ibid. 1878, vii. p. 22; Davidson & Wender, t. c. p. 89; Ball, t. c. p. 229; Cripps, t. c. p. 306; Hume, ibid. 1879 (List Ind. B.), p. 113.

Porphyrio smaragnotus, Sykes (Cat. B. Deccan), P. Z. S. 1832, p. 165 (*nec* Temm.).

Porphyrio neglectus, Schlegel, Mus. Pays-B. *Ralli*, p. 53 (1865); Hume, Str. Feath. 1873, p. 249; Hume & Oates, ibid. 1875, p. 185; Hume, Nests and Eggs, iii. p. 594 (1875).

Grey-headed Gallinule, Lath. Gen. Syn. Suppl. ii. p. 375 (1785); *Purple Coot*, *Blue Coot*, *Sultana Coot*, *Bald Coot*, of Europeans. *Keim*, *Kaima*, *Kalim*, *Kharim*, Hind.; *Kem*, Bengal.; *Nila Bola-kodi*, Telugu (Jerdon).

Kittala, Sinhalese (Layard); *Indura-kukula* in Southern Province; *Sannary*, Ceylonese Tamils (MacVicar).

Adult male and female. Length 16.5 to 17.8 inches; wing 9.8 to 10.2; tail 3.5 to 3.6; tarsus 3.2 to 3.7; middle toe 3.5 to 4.0, its claw (straight) 0.85 to 1.0; hind toe 1.3 to 1.4, claw (straight) 0.9; bill to gape 1.45 to 1.5; casque with culmen 2.2 to 2.5; height of bill at base 0.95 to 1.05; width of casque 0.87.

Iris red; bill and casque darker red, with dusky patches, chiefly on the sides; legs and feet red, the joints of the knees and toes blackish brown; claws pale brown.

Head, face, and throat greyish, tinged with bluish on the face and throat, and washed with brownish purple on the nape and upper part and sides of the hind neck, passing into purplish violet on the lower part of the hind neck, and thence into dark purplish blue on the back, scapulars, and rump; tail blackish, edged on the outer webs of the feathers with greenish blue; wings sombre greenish blue, the lesser wing-coverts edged with a brighter hue, the inner webs and the under surface of the quills black; fore neck purplish grey, passing into lively greenish blue on the chest; breast, flanks, and abdomen dark blue; thighs and under wing-coverts greenish blue, the greater series of feathers blackish; under tail-coverts white.

The plumage of the head and face is variable, both as regards the amount of grey and the tint of the colouring of the occiput, which is duskier in some examples than in others.

Young. The chick is said to be blackish, with the bill blue and red (the basal portion red), and bluish flesh-coloured legs and claws.

Birds of the year have the iris pale red, with the inner edge mottled with brown; bill red; legs and feet reddish, with the joints brownish.

Length about 15.0 inches; wing 9.0; tarsus 3.5.

The face, throat, and neck is more tinged with green than in the adult; the back of the head and neck brownish, with the feathers here and there tipped with greyish; the back and wings sombre greenish blue, passing into brown on the rump and upper tail-coverts, the feathers with pale tips; the greenish-blue chest-feathers are likewise pale-tipped, and the blue of the under surface not so pure as in the adult, with the edges of the feathers greyish; thighs cinereous bluish, with light edges to the feathers.

Obs. Indian examples correspond with Ceylonese in plumage. Some before me, from Madras, in the national collection measure as follows:—wing 9.2 to 9.5 inches; tarsus 3.0; middle toe 3.0 to 3.2; culmen (with casque) 2.5.

Mr. Cripps gives the measurements of a pair as follows:—♂. Length 10.6 inches; wing 9.83, expanse 31.0; tail 4.0; tarsus 3.3. ♀. Length 17.0; wing 10.0, expanse 30.0; tail 3.50; tarsus 3.6.

The dimensions of a ♀ Pegu example are recorded by Mr. Oates as:—Length 17.0 inches; wing 9.6; tail 4.0; tarsus 3.6; culmen (with casque) 2.55.

The genus *Porphyrio* has a singular distribution, the habitat of the species (with one exception) composing it stretching across, in a belt as it were, from Southern Europe through Western and Southern Asia, to China and the Philippines, and thence down through the Malay Archipelago, taking in some of the Western Pacific isles to New Zealand and Australia.

In his able paper on these curious birds, 'Stray Feathers,' 1878, written after an examination of the fine series in the Paris Museum, Mr. Elliot recognizes nine species, besides which Capt. Shelley has described a tenth from Egypt under the name of *P. alleni*, which seems to have been overlooked by that author.

For the information of Ceylon students I will here enumerate these species, many of which I have had the pleasure of inspecting in the British Museum, in the order taken by Mr. Elliot. They are:—

P. cyanocephalus, Vieill. *Hab.* Tasmania, through Eastern Australia to New Guinea, including New Zealand, New Caledonia, and the Chatham Islands.

Char. Back, wings, and tail black, beneath indigo-blue: wing 10.5 to 11.2 inches. Tasmanian specimens are very large.

P. veterum, Gmelin. *Hab.* Southern Europe, Northern Africa, and part of Asia Minor.

Char. Back, wings, and tail dark blue, lower parts blackish blue: "wing 10.75 inches" (*Elliot*).

P. bellus, Gould. *Hab.* Western Australia.

Char. Like *P. cyanocephalus*; chest paler blue; legs and feet grass-green: wing 10.5 inches.

P. calvus, Vieill. *Hab.* Malay Peninsula, Malay Archipelago, and Pacific isles.

Char. Face and chin black; shoulders of wings greenish blue; back olive-green; breast deep blue: wing 8.0 to 9.4 inches. An example from Samoa has much less of the bright blue along the shoulder of the wing than one from Fiji; but both measure alike in the wing 8.5 inches.

P. coelestis, Swinhoe. *Hab.* China.

Char. Like *P. poliocephalus*, but with a white rump. [*N.B.* Seems to be a doubtful species, described from a bird in captivity, perhaps a partial albino.]

P. chloronotus, Vieill. *Hab.* Africa, Madagascar, Mauritius.

Char. Back green; wings blue; chin blackish; flanks and breast bluish purple.

P. poliocephalus. The subject of the present article.

P. edwardsi. *Hab.* Cochin China, Siam.

Char. Resembles *P. poliocephalus*, but is brighter blue on the chest, not so grey about the head; back, breast, and flanks violet-blue: wing 10.75 inches.

P. pulverulentus, Temm. *Hab.* Philippines.

Char. Head and breast greyish blue; back and tail reddish brown; wings blue: wing 9.5 inches.

P. alleni, Shelley. *Hab.* Egypt.

Char. Like *P. veterum*, but much smaller: wing 5.8 inches.

Distribution.—This species of Blue Coot is very generally distributed over Ceylon as regards the various ornithological districts into which the low country may be divided; but it is local, confining itself, for the most part, to tanks and waters which are either overgrown with reeds and other aquatic vegetable growth or bordered by the same. Thus in many secluded tanks in the jungle where one would expect to find it it is absent, and at others where there are large reed-beds or other tangled vegetation it is abundant, even though there be human habitations in the vicinity of its haunt. Of late years, before I left Ceylon, it became quite numerous in the Lotus Pond at Colombo, one of the most public waters in the island, where a dense mass of Lotus-plants and other weeds afforded it shelter; and hence it took up its quarters there. It is to be met with in the swamps beyond Borella and towards Heneratgoda; but in general the cultivated parts of the Western Province are not favourable to its habits. On the shores of the southern arm of the Bolgodde or Pantura Lake it is not uncommon; and the fine sheet of water at Ambalangoda has its share, Coots frequenting the sequestered inlets of its inner shores. In other secluded marshes southward towards Matara it is also found. I observed that it was abundant at Sittrawella and Tissa-Maha-Rama tanks, and met with it also in the Wellaway Korale. At the tanks of the Eastern Province it is common; and the Bintenne Lake is also frequented by it. In one spot near Trincomalee, already referred to in this work, namely the Tamara Kulam, it is very numerous, as also at Topoor tank; and the large Topare tank and other overgrown sheets of water in the interior form great resorts of this species. I do not know that it extends into Dumbara or ascends the hills on any other side.

On the mainland we find it generally distributed throughout India, where there are weedy tanks and jheels, extending through Arakan, Burmah, and the western part of Tenasserim, according to Mr. Hume, as far as 16° N. lat. In the south of the Peninsula we have but little data of its occurrence; we may, however, assume that its distribution is similar there to what it is in Ceylon, for Mr. Bourdillon found it in great numbers at the Vellarney Lake, at the base of the Travancore hills. The Rev. Dr. Fairbank, in his list of birds from the Khandala district, notes a specimen, on the authority of Mr. Blanford, as having been procured near Poona. Messrs. Davidson and Wender state that it is sparingly scattered over the Deccan in suitable localities. Mr. Ball says that it occasionally occurs in Chota Nagpur, and cites the Rajmehar hills, Manbhum, Singbhum, Sambalpur, Nowagarh, Karial, and the Godaveri valley as localities where he obtained or observed it. From Raipur it is recorded by Mr. Hume. In Furreedpore Mr. Cripps says that it is local in its distribution, dozens being seen in some places and none in others which seem just as suitable. Captain Butler, writing of the Mount-Aboo district and of Guzerat, states that it is uncommon in most parts, but very plentiful in some of the tanks overgrown with reeds and dense beds of bulrushes; and Mr. Hume supplements this by saying that it is common in Sindh and Kattiawar, less so in Kutch, where there are not many localities suited to it, and very rare in Jodhpore; whilst speaking of Sindh he observes that it is very abundant in the rush-overgrown lakes. Mr. Oates records it as common in the Engmah swamp in Upper Pegu, and as found also at Boulay, but there uncommon. Dr. Armstrong does not note it from the Irrawaddy delta. As regards the province of Tenasserim, Captain Wardlaw Ramsay records it from Tonghoo; and Mr. Davison from Yeaboo and Assoon. It does not appear to extend to the eastward of the Sittang, and is very local in the portions of this district that it does inhabit.

To the southward of this district there seems to be a long stretch of country down the province from which the genus is absent, beyond which it is represented by *P. calvus*, inhabiting the Malay peninsula and the islands of the archipelago.

Habits —So partial is this species to rush-beds and waters which are overgrown with reeds and impenetrable sedge growth, that it is only found in such spots, not inhabiting (owing solely to an absence of such cover) many places where one would expect to find it. It is again a very sociable bird, being quite gregarious in its habits; and this is another cause which confines it to localities where there is feeding-ground and cover for large numbers of its fellows. In a neglected tank like Topare, through which the floods speedily pass, but leave a large area of shallow water, which in tropical climates speedily becomes a tangled mass of Lotus-reeds, rushes, aquatic plants, and shrubs, the Purple Coot finds a perfect paradise; and dozens may be seen stalking unconcernedly about on the floating leaves and herbage, violently jerking up their tails and showing the conspicuous white under-coverts, keeping all the while well out of shot, and appearing to know that the

swarms of crocodiles lurking about them are the best safeguard against the sportsman wading in within killing distance of them. In spite of crocodiles, however (which in these marshy places belong to the smaller species, *Crocodilus palustris*, which average about 8 to 10 feet in length, and are not dangerous), I have frequently waded for a long time, in search of other and more valuable species, through the haunts of the Blue Coot, and then I observed that he mysteriously disappeared into the surrounding vegetation and remained in concealment until after my retreat. When put on the wing it flies well and swiftly. I have seen one flying round and round the Lotus Pond at Colombo many times before alighting, its long legs stretched out behind him like a Heron's. At the Tamara Kulam, near Trincomalee, the dense rush-growth of which was tenanted by swarms of these Coots, their hiding-place was burnt down once a year by natives, and then they disappeared for some time, making their way probably through the jungle to other haunts in the neighbourhood.

It is chiefly vegetarian in its diet, and is said in India to commit havoc in the rice-fields, concerning which Mr. Cripps states that it cuts the stalks just above the roots and eats the tender pith. I have seen it in grass at some distance from the water, and when disturbed it ran with moderate speed, but with an awkward gait, into the reeds, through which it seemed to force its way without any difficulty. Jerdon styles its note "a fowl-like call," and states that it thrives well in confinement, and has been observed to hold stalks of grain or other food with one of its feet. It is possible that this species may devour the eggs of wild birds; for the European bird, *P. veterum*, remarks Jerdon, "is said to destroy large numbers of wild ducks' eggs by sucking them. One was seen by Canon Tristram to seize a duckling in its huge foot, crush its head and eat the brains, leaving the rest untouched." In this cannibalism it resembles the common Waterhen.

Captain Butler writes concerning its habits in bulrush-beds in Northern Guzerat:—"In such localities I found the bird tolerably tame, and saw them in dozens sitting on the top of the bulrushes, allowing one often to pass within an easy shot of them without flying down . . . From the row they make in the rushes, cackling and chasing each other through the water, I fancy they are very pugnacious.

"I remember," he says, "seeing one once take refuge in a babool tree after being driven out of a thicket of rushes. No sooner had he settled than an Eagle descended into the tree and seized him; the poor Coot cried out piteously, making a noise very like the cries of a domestic fowl when caught to be killed. After waiting a few seconds I approached the tree and the Eagle flew off, dropping the Coot on the ground, which was in a dying state when I picked it up, with a deep wound in the breast, inflicted with the Eagle's claws."

Mr. Hume notices that they have a "flapping, noisy flight, like that of a Peafowl, when flushed out of reed-beds, and that they do not rise more than a few yards in the air." This, however, is not always the case.

Nidification.—In the south-east of Ceylon this bird nests, to my knowledge, in the early part of the year. Mr. Price, of the Public Works' Department, informed me that they nested in the Hambantota district on the borders of swamps and tanks, making a large nest of grass, reeds, and rushes. Two eggs given to me by this gentleman were somewhat of a pyriform shape, and of a stone- or yellow-grey ground-colour, spotted sparingly throughout, one with roundish spots, the other with longitudinal dashes of umber-brown, greyish blue, and purplish brown. They measured respectively 1.9 by 1.38 and 1.9 by 1.34 inch.

From 'Nests and Eggs' I transcribe the following note by Mr. Hume on this bird's nesting in India:—"The Purple Coot breeds all over the plains of India, wherever there are large swamps and jheels with plenty of rush and reed. As a rule, not less than ten pairs breed in the same place. I have invariably in Northern India found the eggs in July and August, never earlier or later; but they are said to have been met with in June and September.

"Two noteworthy points are:—(1st) that all the birds in the same swamp both lay and hatch off at the same time; (2nd) that in two different jheels only a dozen miles apart, and apparently precisely similarly situated, there will be a difference of fifteen days or more in the period of laying of the two colonies . . .

"The nest is made of pieces of rush and reed in amongst thick grass and rice. Sometimes it is on the ground, sometimes, though not free, it is floating. In the latter case the bottom of the cavity will not be above an inch or two from the surface of the water, but there will be a mass of stuff submerged. Ten is the maximum number of eggs that I have as yet found in any nest, and I have repeatedly taken seven or eight

well-incubated ones . . . When fresh the ground-colour varies from a pale pinkish stone-colour to a beautiful pure salmon-pink; but the rosy tint* disappears rapidly." The markings are described as being "rich almost lake-red," mingled with pale purple blotches and clouds. The average of a large number of eggs is 1.93 by 1.39 inch.

* My specimens had been prepared for some considerable time.

G R A L L Æ.

Fam. SCOLOPACIDÆ*.

Bill lengthened and slender, flexible and more or less soft; the terminal portion in one group pitted. Tertiaries elongated. Tail short. Tibia in all but one genus bare above the knee. Toes usually webbed slightly at the base.

Sternum with a high keel; variable as regards the notches.

Genus RHYNCHÆA.

Bill long, slender, the tip slightly swollen and curved, a long groove in the upper mandible and a shorter one in the lower; nostrils linear, placed near the base and closer to the margin than the culmen. Wings moderate, ample, the 1st and 2nd quills equal and longest; tertiaries not quite equal to the primaries. Tail short, rather square at the tip; of 14 feathers. Legs moderately long. Tarsus equal to the middle toe with its claw, and shielded with rectangular scales in front. Toes free to the base; outer toe longer than the inner by the length of the claw; hind toe considerably above the rest.

Sexes differing in plumage.

* N.B.—The Snipes, including the genus *Rhynchoea*, are usually grouped in the subfamily *Scolopacinae*. It is a question, however, whether the Painted Snipe *strictly* belongs to this group, as the structure of its bill and wing differs from the Snipes; and, in fact, it belongs more to the last family than the present.

RHYNCHÆA CAPENSIS.

(THE PAINTED SNIPE.)

Scolopax capensis, Linn. Syst. Nat. i. p. 246 (1766).

Rallus bengalensis, Linn. Syst. Nat. i. p. 263 (1766).

Rhynchæa orientalis, Horsf. Tr. Linn. Soc. xiii. p. 193 (1821).

Rhynchæa variegata, Vieill. Gal. Ois. ii. p. 109, pl. 240 (1824); Schlegel, Mus. P.-B. *Scolopaces*, p. 16 (1864).

Rhynchæa picta, Gray, Sykes, P. Z. S. 1832, p. 164.

Rhynchæa bengalensis (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 273 (1849); Kelaart, Prodromus, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 677 (1864); Blyth, Ibis, 1867, p. 167; Blanford, Zool. Abyss. p. 432 (1870); Swinhoe, P. Z. S. 1871, p. 408; Holdsw. P. Z. S. 1872, p. 473; Hume, Str. Feath. 1873, p. 235; Salvadori, Ucc. di Borneo, p. 335 (1874); Legge, Ibis, 1874, p. 28; id. J. A. S. (Ceylon Branch) p. 53 (1874); Oates, Str. Feath. 1875, p. 346; Hume, Nests and Eggs, iii. p. 586; Legge, Ibis, 1875, p. 402; Butler & Hume, Str. Feath. 1876, p. 15; Fairbank, *t. c.* p. 263; Butler & Hume, *ibid.* 1877, p. 223; Wardlaw Ramsay, Ibis, 1877, p. 469; Blakiston & Pryer, Ibis, 1878, p. 225; Hume, Str. Feath. 1878 (B. of Tenass.), p. 459; Davidson & Wender, *ibid.* 1878, vii. p. 89; Ball, *t. c.* p. 228; Cripps, *t. c.* p. 302; Hume (List Ind. B.), *ibid.* 1879, p. 112.

Rhynchæa capensis (Linn.), Layard, B. of S. Afr. no. 625 (1867); Shelley, B. of Egypt, p. 250, pl. xi. (1872); Von Heuglin, Orn. N.Ost-Afr. t. ii. p. 1211 (1873); Walden, Trans. Zool. Soc. 1875, ix. p. 235; Barratt, Ibis, 1876, p. 212; Tweeddale, P. Z. S. 1877, p. 551.

Cape Snipe, Latham; *Bécassine du cap de Bonne-Espérance*, *Béc. de Madagascar*, *Béc. de la Chine*, Buffon; *Goldschnepfe* of German authors; *King Snipe*, "Painter," Sportsmen in Ceylon. *Pengung*, Java (Horsf.); *Choseh hindi*, Arabic (Von Heugl.); *Tama-shigi* Japan (Blakiston); *Rav-Rav*, Madagascar (E. Newton).

Raja kæsawatuwa, *Raja watuwa*, Sinhalese.

Adult male. Length 9·5 to 9·8 inches; wing 5·2 to 5·4; tail 1·5 to 1·6; tarsus 1·7 to 1·8; mid toe and claw 1·65 to 1·75; bill to gape (straight) 1·8 to 1·9.

Iris brown; bill, basal half of upper mandible and all but tip of lower dusky greenish (palest in the female), changing to reddish or livid brown on the remainder; legs and feet sickly green or greenish leaden.

Lores and crown olivaceous blackish, with a buff mesial stripe down to the base of bill, and a broad band of the same behind and passing round the eye; neck behind and on the sides drab-grey, mottled with black, and paling on the fore neck and chest, across which the colour is edged with blackish; a dark stripe below the orbital band; chin, gorge, and lower face whitish buff, passing into the colour of the fore neck; back, lesser tertial coverts, rump, and tail cinereous, with black cross-pencillings and bars and spots of buff-yellow; interscapulars, scapulars, and tertials clouded with greenish black and glossy olivaceous brown, with a purple sheen in some lights, many of the feathers barred and marked with buff, and some of the scapulars with broad central and lateral stripes of buff and white; wing-coverts olivaceous green, barred and spotted with buff, the spots edged with black; quills fine grey, with wavy cross rays of black and some bar-spots of white near the tips of the secondaries, the outer webs spotted with large black-edged ocelli of buff, the interspaces towards the base in the outer primaries being black; breast, lower parts, axillaries, and median under wing-coverts white, passing through the olive and blackish sides of the upper breast in a band, which extends round to the shoulders.

Female. Length 9·8 to 10·0 inches; wing 5·4; tarsus 1·8 to 2·0; bill to gape (straight) 1·9 to 2·1.

(December and June.) Crown and mesial stripe as in the male; orbital circle and streak behind the eye white, with the surrounding dark border blacker than in the male.

Throat, cheeks, fore neck, and centre of hind neck ferruginous, paling to whitish on the chin, and deepening on the chest and sides of breast into olive-black; back and wing-coverts deep olive-green, variegated with black cross rays and ashy bars, the coverts wanting the ocelli and light markings; ground-colour of the primaries darker, and the ocelli not so pale as in the male; breast and lower parts white, passing over the dark sides of the upper breast in a band round to the shoulders, where it is continued down the sides of the interseapular region as a narrow buff line; a tuft of long *pure white lanceolate* feathers beneath the scapulars.

I find no appreciable difference in any of the specimens I have seen killed in both seasons of the year. The amount of rufous at the back of the neck is variable, some examples have more of it than others. As a rule, Ceylonese birds have the hind-neck feathers tipped with brown, which, more or less, according to the amount, obscures the chestnut-colour of the bases.

Young. The nestlings much resemble the male in plumage at first. The back, wing-coverts, and quills in two examples brought to me from the nest were of the same colour, and with the same spots and ocelli, but they had a broad fulvous stripe bordering the scapulars.

Young birds in a more advanced stage before me, from Calcutta, and in the national collection, are plumaged as follows:—the male has the same distribution of markings as the old bird, the feathers of the head, scapulars, and back being merely tipped with white, and the buff markings on the wings are more extensive than in an adult, there being less of the olive-green hue; there is more white about the throat, and the chest is paler, the lower part being fulvous; the coronal stripe is very broad.

The female, which is perhaps a little older and in its second plumage, has the head-feathers tipped with white; the chin white, and the chestnut feathers of the fore neck mingled with whitish ones, while the dark chest-feathers are broadly tipped with the same colour.

Obs. The question has of late years been mooted as to whether the plumage of the female Painted Snipe is not seasonal, and the pale spotted dress donned during non-breeding-time. From personal experience in Ceylon I am unable to furnish any information on the subject, as all female specimens examined by me have been in the dark dress; and as there is no regular breeding-season there, it will be a difficult matter to obtain satisfactory proof of this alleged change of dress without examining an enormous number of specimens. I am inclined to think that the female does assume, at some period, to a great extent, the dress of the male, the neck and chest entirely resembling that of the other sex, but the back remaining very dark. I am supported in this view by the evidence of such an example from Japan in male dress in the British Museum, which possesses the concealed *white lanceolate* scapulars characteristic of the female. The fact of both sexes being attired when young in the male dress is conducive to the opinion in question. In 'Stray Feathers' (*loc. cit.*) Captain Butler notices the fact that nearly all the specimens shot by him in Guzerat were in male dress, 19 *presumed* males having, on one occasion, been shot by him without flushing a single female. No examination appears to have been made; and it is possible that these really were all males, congregated together after the manner of other species in the non-breeding period. Mr. Hume considers that the females lose the chestnut collar in the winter, as examples in his possession, shot in January, only show slight traces of it. There is much yet to be learnt concerning the plumage of this species, but in the meantime it is only reasonable to suppose that the dark plumage of the female is not assumed until the first time it breeds.

Indian examples correspond with Ceylonese in their plumage; females, perhaps, have more rufous-chestnut on the throat and neck than the latter. A female from Malabar measures:—wing 5·5 inches; tarsus 1·7; bill to gape 1·78. It corresponds in general plumage, but is conspicuous for having the face well covered with the black hue. Females from Nepal are similar to the above, and measure:—wing 5·3 to 5·5 inches; tarsus 1·75 to 1·9; bill to gape 1·85.

Examples from China and Formosa measure:—Males: wing 5·0 to 5·2 inches; tarsus 1·5 to 1·7; bill to gape 1·7 to 1·8; they are somewhat paler above than the generality of Ceylonese males, and have the head-stripe very broad.

A Formosan male (?) is much paler above than Ceylonese and Indian specimens; the olive-green colouring is predominated over by the very extensive buff markings, which on the scapulars and tertials take the form of broad bands across both webs; the same golden-buff bars are conspicuous on the tail, and the markings of this colour on the interseapular region are very conspicuous; there is a *white lanceolate feather* beneath the scapular tuft, which is perhaps a proof that the specimen is a female in male dress. For an examination of this specimen, and

another almost similar to it, I am indebted to my friend Mr. Seebohm; they are in the Swinhoe collection, and measure:—wings 5.15; tarsus 1.6; bill to gape 1.8.

A female (N. Formosa, British Museum) comes pretty close to Ceylonese birds; the black on the lower part of the fore neck is somewhat sharply defined against the rufous. Wing 5.3 inches, tarsus 1.9.

Jerdon unites the African Painted Snipe with the Indian; and in this he is followed by Von Heuglin, Mr. Blanford, and Lord Tweeddale. Mr. Gurney and Captain Shelley likewise recognize them as one. I have examined examples of *R. capensis* from Abyssinia, and do not find that there is any material difference. Swinhoe says that the African birds have the chin bare; but this observation, I imagine, may have been the result of an examination of imperfect specimens. The Abyssinian birds in question, collected by Mr. Blanford, were merely singular in wanting the reddish lustre perceptible in some Asiatic specimens; and this was probably an individual peculiarity, the markings were in all points similar to those of Ceylon birds, and the olivaceous tints the same. Dimensions of a male:—wing 5.2 inches; tarsus 1.6; middle toe 1.3; bill to gape 1.7.

R. australis, Gould, the Australian representative, is very similar in appearance to the present bird; but is entitled to specific rank on account of its *short feet*, and a singular difference in its anatomy, which I have myself observed in a Victorian specimen shot near Melbourne. The trachea passes down between the skin and the muscles for the whole length of the body, and makes four convolutions before entering the lungs. The wing is proportionately longer than in *R. capensis*, and there are slight differences in coloration about the face and back; the inner web of the 1st primary is darker. An example before me measures:—wing 5.5 inches; tarsus 1.5; middle toe 1.3.

The South-American species (*R. semicollaris*, Vieill.) is quite distinct from either of the aforementioned. The female has the entire neck olive-black; the crown black, with the buff mesial stripe; at the sides of the neck next the shoulder is a bar of white, and on the wing-coverts are large round spots of the same; the scapulars have a broad lateral outer border of rich buff. In size also it is much inferior—wing 4.1 inches; tarsus 1.4; bill to gape 1.5; the bill is much curved at the tip.

Distribution.—The Painted Snipe is a permanent resident in the lowlands of Ceylon; but on the west and south coasts there is an increase of its numbers at the commencement of the cool season; and in November, December, and January it is more plentiful in the country west of the Kandyan ranges and in the south of the island than during any other time of the year. Whether this increase is caused merely by an internal migration from the solitudes of the interior, where it may breed, or whether it is the effect of a general increase to the species from the south of India, I am unable with certainty to state; but it is, I think, very probable that there is both a migration to Ceylon during the month of October, and also an internal movement, as is the case with other birds, towards the west coast. It is common in the paddy-fields from Negombo southwards to Galle and Matara about Christmas-time, and I have likewise known it to be pretty numerous about Morotuwa in June. A favourite locality in the south for it is the large stretch of paddy-land lying between Waekwella and Baddegama; and this being the chief resort of Galle sportsmen in the Snipe-season, many "Painters" fall to their guns. I have, however, never known more than three couple killed there at one time, and this was by Mr. Weir, of the P. & O. Service. It is numerous in the Matara district, and I have met with it and found it breeding in the Girawa Pattuwa, near Hatagalla. In suitable localities in the Eastern Province and throughout the northern forests near tanks it is frequently seen; but it wanders about a good deal, and one is not certain of finding it in any particular places, save such large marshes as are to be found at Tamblegam, Minery, and other spots. In the Trincomalee district I observed it oftener in salt marshes than in the Snipe-grounds. It is common in the extreme north, and is a well-known bird in the Jaffna district. Mr. Frank Fisher, of the Ceylon Civil Service, writes me that it affects the paddy-fields and marshes about Chavagaeheri in numbers, and that he has shot as many as 5½ couple at one time in that locality. I am not aware to what elevation it ascends; but it most probably visits paddy-fields on the flanks of the Kandyan mountain up to about 1000 feet.

In India Jerdon writes that it "wanders about a good deal according to season, and many will be found in paddy-fields in the south of India in October and November, leading the observer to conclude that they are as migratory as the true Snipe. I have," he remarks, "found them breeding in Malabar, the Deccan, and Bengal." In the Deccan, according to the Rev. Dr. Fairbank, it is a permanent resident; and Mr. Davidson likewise says that it is common there, probably breeding. In Chota Nagpur it is found in suitable localities; and Mr. Ball considers that many remain throughout the year; he records it from Manbhum, Lohardugga, Singbhum, Sirguja, Sambalpur, Jaipur, and the Godaveri valley. Mr. Hume notes it

also from Raipur. Mr. Cripps believes it to be a permanent species in Furreedpore. At the Sambhur Lake it is found in the rains; but in Sindh it is only a cold-season straggler, though in Guzerat it is more plentiful at that time. Captain Butler, who writes of it as common there, says that it arrives at the end of August, and breeds in September and October near Ahmedabad and Erinpoora. Captain Hayes-Lloyd considers it to be a permanent bird in Kattiawar. Turning eastwards I find that it is not recorded as ascending the Himalayas; but in Cachar it is, according to Mr. Inglis, rare; and in Burmah, according to Mr. Oates, it is common. Further south we find it rarer; in the Rangoon district Captain Wardlaw Ramsay has procured it, and at Moulmein it has been shot by Captain Bingham. We have no data of its occurrence in the Malay Peninsula; but it doubtless will be some day added to its avifauna. In Sumatra it was obtained by Sir Stamford Raffles and by Herr S. Müller. In Java it was observed by Horsfield, Boie, Kuhl, and Van Hasselt; and Croockwit has added it to the avifauna of Borneo. It was first obtained in the Philippines by Cuming, but the locality is unknown; recently, however, it was procured in the island of Mindanao at Zamboanga, by the officers of H.M.S. 'Challenger.' Returning towards the continent we find Swinhoe recording it from Hainan and from Formosa, in the latter of which islands it was tolerably common. He obtained it at Amoy, and notes in his Catalogue (P. Z. S. 1871) that it is found throughout China in the summer. In the Japanese islands it breeds on Fujisan, as noticed by Messrs. Blakiston and Pryer, and is also found at Tokio and at Yokohama. Von Siebold also procured it in Japan. Prjevalsky met with it in S.E. Mongolia, and found it breeding at Lake Tsaidemin-nor.

I find no statement of it inhabiting Western Asia save that of Antinori that it occurs in Asia Minor; but in uniting the African species with it, we find the Painted Snipe common in portions of Northern Africa, whence Messrs. Shelley, Taylor, and Gurney have recorded it. In the 'Birds of Egypt' the former gentleman writes, "This species ranges throughout Egypt and Nubia, and is not uncommon at times in the Delta and the Fayoom, where it may occasionally be met with in flocks, though more often singly. It remains in the country throughout the year, and breeds in May." Both sexes, especially the female, are very well figured in Captain Shelley's excellent plate. In West Abyssinia Von Heuglin obtained it in February, and he remarks that it is very common in Lower Egypt; in the coast districts Mr. Blanford got it, and Brehm and Vierthaler observed it on the Blue Nile in December. Von Heuglin also found it breeding in May in the Abuzabel district. Following it down the east coast, we find it recorded from Mozambique and also from Madagascar. In the latter island Mr. E. Newton records it as met with by him from Andoviranto on the east coast to Ambohitroni, and also at Soamandrikazay; and Dr. S. Roch procured it at Farafata. Mr. Ayres speaks of its occurrence in the Transvaal; and Mr. Barratt obtained it near Potchefstroom. In Cape Colony Layard procured it; and Andersson added it to the birds of Damara Land. In Western Africa it was obtained by Hartlaub; and I find it recorded by Von Heuglin from Senegal, Bissao, Gaboon, Gambia, Benguela, and Angola, which widely-separated localities, as will be seen by a glance at the map, give it a vast range on the west coast of the continent.

Habits.—This very interesting species resembles in its mode of life and habits the Rails more than the Snipes, and, indeed, may be considered to form a link between the two families. It is particularly fond of rushy and reedy marshes, but is found in paddy-fields as well; and it generally selects a somewhat secluded locality, such as the corner of a large swamp or paddy-field, in which several individuals, but more often a pair, will be found, while for miles round not another individual will be met with. As a rule, it is found not far from water—that is, if there be any ponds, ditches, or wet places in the fields which it frequents. It is very often flushed singly, but in reality associates, as a rule, in pairs, one bird of which is frequently passed over, as it lies very close and will not rise until nearly trodden upon. It then flies straight away, with rather slow flappings of its ample wings, and suddenly drops, like a Jack Snipe, into the grass. It is frequently missed by good shots when, after banging away at quick-flying Snipe, they unexpectedly flush one of these birds and do not allow for its much slower flight. It not uncommonly enters the water when winged, and swims well. Mr. Fisher writes me, "When walking up wounded and unwounded birds I have seen these Snipe take to the water and swim several yards across to ground further on, in their endeavours to hide themselves." Mr. Young, of the Survey Department, likewise tells me that he once saw two young birds swimming across a pond after their parents were flushed, with the hen bird flying round them in a great state of alarm.

The Painted Snipe feeds much on very small Mollusca. I once found a number of good-sized univalve shells in the stomach of an individual which I shot in a salt marsh; and on other occasions I have detected minute snails in its gizzard. Like the true Snipes, I imagine that it searches for its food to a great extent at night, lying quiet in the daytime. Mr. Ball remarks that he has frequently flushed them from under the "shelter of *Tamarix* bushes in the beds of rivers." In Formosa and China Swinhoe seems to have observed this bird chiefly in marshy places; and we learn but little from his notes concerning its economy, except that he found its food to consist of Crustacea.

That exceedingly observant naturalist, Von Heuglin, however, appears to have closely investigated its habits while he was in Northern Africa; and the result of his observations tends to show its affinities with the last family of birds. He remarks that in Lower Egypt, though it is common, it is not often seen, on account of its nocturnal habits and propensity for concealing itself; it there affects the thickest sedge, long grass, rice-fields, the borders of lagoons, small ponds, brooks, and the edges of muddy overgrown dykes. Like the Rails, to which he observes it bears a resemblance in its actions, it is with difficulty flushed during the heat of the day, and can be more easily found on moonlight nights, or with the help of a pointer, when it will allow itself to be taken by hand. If surprised in an open spot, it escapes into the nearest thicket, and there remains motionless. Its flight is likened to that of the Land-Rail as being more laboured and fluttering, and suddenly terminated after from 10 to 20 paces by the bird dropping into the grass, giving one the impression that it had suddenly lost the power of flight.

It is, in general, entirely silent. I have never once heard it give vent to a note on being flushed; Brehm, however, likens its voice in the spring to a rather loud dissyllabic cry resembling *nāeki, nāeki*.

I find the following note, contributed some years ago to 'Nests and Eggs' (*l. c.*), on a nestling which I had in my possession at Galle, and which was very quaint in its actions:—"It lived but two days, and was confined in my back yard, where it used to run about, hiding behind tubs, chatties, and such articles; when tired, it used to rest its head by placing the point of its bill on the ground, after the manner of the *Apteryx*; when pursued it would spread out its wings and squat on the ground, and then run a little distance, crouching down again." Blyth remarks that the young "with feathers half-grown spread the wings and tail, displaying their beautiful markings, and try to look fierce at the beholder." He has likewise noticed that when surprised the adult "has the habit of spreading out its wings and tail, and so forming a sort of radiated disk, which shows off its spotted markings, menacing the while with a hissing sound and contracted neck, and then suddenly darting off."

Nidification.—The Painted Snipe either has two broods in the year, or else it breeds indiscriminately at all seasons. It may be said, however, as a rule, that more nests are found, young captured, and eggs taken from dead birds between November and May than at the opposite season of the year. I have seen an egg taken from a specimen at Galle in March, young captured at Wackwella in September, and know that nestlings have been seen in May at Odogamma. In the Colombo district eggs have been procured in April, and young found by Mr. MacVicar in February. Mr. Holdsworth mentions the fact of a wounded bird laying an egg in a basket in which it was confined on the 31st December; but at this time of the year I have killed birds in the north of Ceylon which showed no signs of breeding.

Layard states that the season of nidification is from May till July; but this observation is perhaps based upon a single occurrence. I myself shot a female which had evidently risen from the nest, in July, in the Hambantota district; but I do not think, as I have just remarked, that as many birds lay then as during the cooler months. The nest is placed upon the bund of a paddy-field or in swamp-grass and rushes, and is made of grass and rush-blades. Layard says it consists of a slight depression in the soil, lined with a few tufts of grass. I have never seen one myself; but as regards its shape and size I find that Mr. Hume describes one which Mr. A. J. Rainey sent him from Khalispor, in Jessore, as a large circular pad of mingled coarse and fine rice-straw, some 6 inches diameter and about 1.75 in thickness, and with a central depression of about $\frac{3}{4}$ inch in depth. The number of eggs laid in Ceylon seems usually to be four. They are of a beautiful stone-yellow ground, very boldly marked with widely-separated blotches or clouds of brownish black or very deep sepia, beneath which lie bluish-grey and light-brown blots in some eggs, while others are streaked with black lines among the clouds. Some eggs are chiefly marked at the large end, while others have the blotches

evenly distributed. But the *character* of the egg consists in the proportionately large size of the markings; it is pyriform in shape and very small, compared with those of most Waders. An example in my collection measures 1·36 inch in length by 0·98 in breadth.

In India it has been found breeding in September and also in December. In the former month its eggs have been taken in Jessore and in Raipur, and in the latter at Chamrajnugger, in the Mysore district. Mr. Hume remarks that the markings often cover half the egg; the average size of ten he gives as 1·4 by 1·01 inch.

Genus SCOLOPAX.

Bill long, straight, slender, soft; extreme tip decurved, and the extremity of the lower mandible fitting against this portion; both mandibles channelled, the lower only to the middle; nostrils linear, placed near the base; gape in advance of the base of the culmen. Wings long; the quills curved, the 1st the longest. Tertiaries rounded at the tip. Tail short, of 12 feathers, cuneate at the tip. Legs short. *Tibia feathered to the knee*. Tarsus equal to the middle toe, covered with transverse scales in front. Toes free to the base, the lateral ones equal; claws very short; hind claw not projecting beyond the toe.

Eye very large and placed far back. Ear-conch enormous.

SCOLOPAX RUSTICULA*.

(THE WOODCOCK.)

Scolopax rusticola, Linn. Syst. Nat. i. p. 243 (1766); Gould, B. of Eur. iv. pl. 319 (1837); Blyth, Cat. B. Mus. A. S. B. p. 271 (1849); Kelaart, Prodromus, Cat. p. 135 (1852); Middendorff, Sibir. Reise, p. 223 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 670 (1864); More, Ibis, 1865, p. 437; Godman, Ibis, 1866, p. 101; Shelley, B. of Egypt, p. 247 (1872); Legge, J. A. S. (Ceylon Branch) p. 64 (1873); Gould, B. of Gt. Brit. iv. pl. 77 (1873); Hancock, B. of Northumb. p. 102 (1874); Anderson, Str. Feath. 1875, p. 356; Blanford, Zool. Persia, p. 782 (1876); Fairbank, Str. Feath. 1877, p. 409; Butler, *t. c.* p. 504; Dresser, B. of Europe, pt. 61, 62 (1877); Blakiston & Pryer, Ibis, 1878, p. 221; Hume, Str. Feath. 1878 (B. of Tenass.), p. 458; Ball, *ibid.* 1878, vii. p. 228; Hume, *ibid.* 1879 (List Ind. B.), p. 112.

Scolopax rusticola, Linn.; Swinhoe, P. Z. S. 1871, p. 407; Holdsw. P. Z. S. 1872, p. 472; Schelgel, Mus. P.-B. *Scolopaces*, p. 2 (1864); Von Heuglin, Orn. N. Ost-Afr. p. 1208 (1873); David & Oustalet, Ois. de la Chine, p. 473 (1877); Seebohm, Ibis, 1879, p. 26; Wharton, *t. c.* p. 454.

Scolopax indicus, Hodgs. Journ. As. Soc. B. vi. p. 490 (1837).

La Bécasse, Buff. Hist. Nat. Ois.; *Waldschnepfe*, German; *Houtsnip*, *Woudsnep*, Dutch; *Gallinhola*, Portuguese; *Gallineta*, Andalusia; *Chocha*, Spanish; *Sou-mirh*, Morocco (Drake); *Ilmar el hedjel*, lit. "the Donkey of the Partridge," Moorish (Irby). *Szalonka*, Transyl. (Danford); *Hodo-shigi*, Japanese (Blakiston); *Yelfi*, Asia Minor (Danford); *Sim-titar*, *Tutatar*, Hind.; *Sim-kukra*, Kumaon (Jerdon).

Adult male, very fat (Wales, November). Length 13.9 inches; wing 8.0, expanse 24.5; tail 3.6; tarsus 1.46; middle toe 1.46; bill at front 2.93. Weight 12½ oz.

Adult, presumed female (Bhootan). Length 14.25 inches; wing 8.0; tail 3.3; tarsus 1.41; middle toe 1.41; hind toe 0.43; bill at front 3.27.

Female (shot from the nest, Himalayas). "Length 13.2 inches; wing 7.5; tail from vent 3.3; tarsus 1.5; bill 3.3." (*Anderson.*)

Male in course of migration, "not fat, but in fair condition" (Karachi). "Length 13½ inches; wing 7¾; tail 3¼; bill at front 3.0; expanse 24.0. Weight 8 oz. 9 dwts." (*Buller.*)

Presumed male, excessively fat (Wales). Wing 8.0 inches; tail 3.5; tarsus 1.45. Weight 14½ oz.

Adult female, December (Wales). Length 13.8 inches; wing 7.8; bill at front 3.0. Weight 11¼ oz. The bill is larger in the female than the male.

Obs. The enormous variation in the weight of the Woodcock is entirely dependent on the condition of the individual, as I have endeavoured to show by the above data. It becomes so fat that the entire body is encased in an unbroken coat of grease, and it then of course reaches its maximum weight. Jerdon gives the average as 9 to 10 oz., and the extreme range 7 to 14 oz. or more.

* Mr. Wharton (*loc. cit.*) clearly demonstrates that *rusticula* is the correct orthography, it being the Latin in classical times for some kind of Partridge or Grouse. *Rusticola* is a meaningless word.

The following are data of the only two Ceylonese examples that have been, so far as I am aware, preserved :—

- (a) *Adult* (sex ? : Nuwara Eliya, Jan. 1872). Wing 8·0 inches ; tarsus 1·4 ; bill at front 3·15. (b) *Female* (Hakgala, Feb. 1877). Length 14·0 inches ; expanse 26·0 : weight 10 oz.

Iris dark brown ; bill slightly brownish at the base, from that fleshy, then darkening to blackish at the tip ; legs and feet greenish grey, brownish on the toes (British example in flesh).

- (a) Lores, chin, and forehead fulvous grey, tinged with brown ; top of head and occiput rich blackish sepia, barred with two narrow bands of rich fulvous tawny ; a darkish line down the forehead to base of bill, and a broad stripe through the lores from the gape to the eye ; general aspect of plumage above dark sepia-brown and ferruginous, the wing-coverts and back being barred with rich rusty, and the scapulars, interscapular region, lower hind neck, and tertials mottled marginally and indented with it ; the upper back and scapulars are also tipped and crossed with rich buff, mostly on the outer webs, the dark portions being sepia-black like the head ; lower back and rump barred narrowly with black and ferruginous alternately ; the upper tail-coverts more rufous than the rump, and the bars mottled and more wavy, some of the feathers tipped with grey ; lower wing-coverts blackish brown, barred with ferruginous, which predominates at the tips ; greater wing-coverts barred chiefly with buff ; quills and primary-coverts dark hair-brown, barred with ferruginous on all but the first two primaries, and indented with buff at the inner margins ; the first primary is edged with white, this colour indenting the brown near the shaft, the second is indented with buff ; tail black, with ferruginous indentations on the outer webs, and the tips, for nearly half an inch, brownish grey above and silvery white beneath.

Beneath fulvous tawny ; chin whitish and the throat barred with brown, the lower part of the face striped with the same ; the chest and breast narrowly barred with brown, the bars on the flanks bolder than elsewhere ; under tail-coverts with central brown marks and cross bars ; axillaries brown, banded with fulvous buff ; under wing-coverts buff, barred narrowly with brown ; the greater series brown, barred with pale buffy.

The above description of the Nuwara-Eliya specimen, now in the possession of Mr. Holdsworth, was taken before the skin was made up, when it was in a rough state, and is not as exhaustive as it might be ; yet I prefer to give precedence to it as being a Ceylon-killed bird. The Hakgala example I have not examined.

Albinos are occasionally met with. Messrs. Blakiston and Pryer speak of a specimen all creamy white, obtained at Kawasaki in Japan, and now in the Milan Museum.

Young (chick, Azores). Crown, hind neck, and centre of the back dark brown-maroon, deepening into black at the forehead, and with a stripe of the same through the lores, above which, and across the crown, are stripes of buff ; rest of the body above ferruginous, patched and otherwise marked with buff ; under surface rufous-buff, variegated at the sides of the throat with brownish rufous. The nestling at this age is very handsome.

Bill black, yellowish at the base, measuring at front 0·6 inch.

Nestling (about 5 weeks old : British Museum). Has much the same character of marking as an old bird. The crown is black, the feathers with rufous bases ; down the hind neck is a rufous band bounded on each side by a white one ; the back and wings are rufous, barred with black and patched with fulvous ; wings much as in the adult ; fore neck and under surface buff, with wavy transverse bars of black, and with a wash of rufous on the sides of the chest.

Yearling birds have the under surface devoid of the buff hue, the colour being dusky white ; the under tail-coverts are the same instead of being rich buff, and are barred throughout from base to tips with brown, and not marked with handsome pointed stripes, as in the adult ; the outer web of the 1st primary has a white edge, but next the shaft it is brown, *indented with the white of the margin*.

Obs. There seems to be little variation, *dependent on locality*, in the plumage of the Woodcock throughout its widely extended habitat ; but examples from the Atlantic isles, where it is a resident species, are smaller than continental birds. A Madeira skin, ♂, in the national collection measures—wing 7·5 inches, bill to gape 2·42, tarsus 1·3 ; another ♂, from the Azores, measures—wing 6·9 inches, bill to gape 2·5, tarsus 1·2.

Individual variations are noticeable in examples from the same locality or country, and are chiefly dependent on age. Some birds are very dark, notably Indian and Eastern-Asiatic specimens ; others are lightly and richly coloured. In some the cheeks are darkly striped, and in some there is a coalescing of bold dark markings across the throat, forming an irregular band. The marking of the outer web of the first primary varies much, and was formerly considered to be a sexual sign : the deeply indented white border is unquestionably a mark of nonage, and is most noticeable in birds with barred under tail-coverts ; but it exists in many manifestly adult birds, while in other skins in the like plumage there is either a plain white border at the base or nearly all along the quill to

the tip; and the latter are probably the older examples. The *plain* white border exists irrespective of sex, although I am inclined to think that it is more highly developed in females than in the other sex.

The little American Woodcock, *Scolopax minor*, in which the wing measures 5·0 inches and the bill at front 2·4 to 2·5, differs chiefly in having a plain under surface, which is dusky buff, and rufous on the flanks; the occiput and nape are black with two bands, as in the present species. *Scolopax saturata*, Horsfield, is a Javan species and very rare, and in size it is intermediate; "the breast and abdomen are sooty black, with irregular dusky bands." The wing in a specimen in the Leyden Museum measures 5·8, bill in front 3·0. *S. rochussenii*, the king of the genus, is another very local species from Ternate—black above, buff beneath, and beautifully marked with the same above. An example in Mr. Harting's collection measures—wing 8·0 inches, bill 3·7.

Distribution.—The Woodcock has long been said to be an occasional visitor to the hills of Ceylon, but until lately no specimen had ever been preserved. Kelaart first noticed its occurrence as follows:—"The Woodcock, the same as the European species, is found on Horton Plains, and occasionally at Nuwara Eliya. We have not seen the bird in its feathers, but we have seen a couple of birds called 'Woodcocks' at a dinner-table which tasted uncommonly like the birds of that name. We have no doubt of its existence in the island, as several English sportsmen assured us of their having shot it." Layard, who did not collect in the upper hills, had no opportunity of meeting with it; and Mr. Holdsworth, who spent much time at Nuwara Eliya while he was in the island, never came across it. In February 1876 a well-known Ceylon sportsman, Mr. Frank Fisher, of the Civil Service, shot a fine example at Nuwara Eliya, news of which reached Mr. Holdsworth in time for insertion in his catalogue. This bird was fortunately preserved, and is the subject of the above description. In January 1877 a second specimen was shot in the Hakgala Gardens by the superintendent, Mr. Thwaites. It frequented the locality for some little time previous to its being killed, and appeared to have taken up its quarters there.

It is not improbable that a few birds stray over to Ceylon every year from the hills of Southern India, but they escape notice owing to the jungly nature of the country. I worked the ground at Horton Plains thoroughly at the same time that the last-named bird was shot, but saw no sign of a Woodcock. It should be looked for from November until February.

In India the Woodcock is a migrant of only local distribution. Jerdon gives us the most complete note concerning it yet published, which is as follows:—"The Woodcock is a winter visitant to the more elevated wooded regions of India, the Himalayas, the Nilghiris, the Pulneys, Shervaroys, Coorg, and doubtless all the higher ranges of Southern India. During its periodical migrations individuals are occasionally killed in various parts of the country. Several were procured in the Calcutta market by Blyth. I have heard of its having been at least once obtained in the Madras market; and various other instances of its having been procured in different parts of the country have come to my knowledge, viz. at Chittagong, Berhampore, Noacolly, Tipperah, Dacca, Masulipatam, &c. The Woodcock is late in arriving, generally not appearing before the middle of October, and usually later; it leaves in February." Scarcely any data concerning its occurrence in Southern India, of late years, is to hand. The Rev. Dr. Fairbank is the sole writer who notices it in 'Stray Feathers,' and remarks:—"I flushed a Woodcock in the Kodaikānal in 1867. Afterwards one was obtained there by Mr. Levinge; but they are certainly rare in the Palanis." These are the most southerly ranges in the Peninsula, save the Travancore hills; and as they are so rare in them it is not likely that they would be plentiful in Ceylon. On the southern slopes of the Himalayas it is a resident bird, breeding there in many localities. Mr. Brooks met with one in the valley of the Bhagarati; and my late friend, Mr. A. Anderson, found a nest with four eggs at 10,000 feet elevation, near Naniak, in Upper Kumaon. Mr. Wilson (better known as "Mountaineer") likewise obtained its nest at Gangotri, and Captain Duff at Kullu (*Hume*). Captain Butler procured it in Sindh, about two miles from Karaehi, in November 1877, and he records the fact of Mr. James meeting with it in the North-Canara jungles. Two individuals were also killed by Col. W. Peyton and Mr. J. S. Laird in December 1877, near Belgaum. These stray birds are picked up during their migration; and Mr. Hume remarks that there is scarcely a district in India from which he has not some record of their occurrence, and that at such unlikely places as Allyghur, Booludshur, Agra, Cawnpore, &c. single individuals have occurred. Mr. Ball records it from Raipur. On the Burmah side of the Bay it is rare. Col. Brown procured one at Moulmein; and Mr. H. B. Davidson, superintendent of police, shot one near Rangoon and another near Tavoy in Tenasserim. Mr. Hume, who notes these

occurrences, likewise records the shooting of one by Mr. J. C. Davis at Thatone. From the Malay peninsula it has not been recorded, so that in this direction Tenasserim is its southernmost limit.

In China it is, according to Swinhoe, found throughout the country in winter; and I notice that he records it from Chefoo as late as the 30th April. He does not appear to have noticed it at Hainan or Formosa. Messrs. Blakiston and Pryer say that it is common at Tokio and South Japan in winter, and that it migrates north to Yezo in the spring. Mr. Whitely procured it at Hakodadi.

The majority of the birds found in India in the cold season are no doubt arrivals from northern climes, as it can only breed in limited numbers in the Himalayas. We find that Severtzoff remarks upon it as a bird of passage only in Turkestan; but at Kashgar Stoliczka noticed it in November and December, after which latter month it disappeared. In Persia it is a winter visitant, the rose-gardens there being, according to Major St. John, its favourite haunt. Mr. Blanford likewise says it is common in gardens in that country. In Palestine Canon Tristram met with it; and in Asia Minor Mr. Danford says it is generally distributed in the mountains in the winter.

Mr. Dresser thus sketches out its distribution in Northern and Central Asia:—"In Siberia it is known as a summer visitant; and Dr. Dybowski states that it breeds in the Baikal Mountains, and remains until September. Von Middendorff met with it in the Stanowoi Mountains nearly to the summit, and observed it passing there between the 2nd May and 1st of June. Von Schrenck does not record it; but Dr. G. Radde says that after sunset he frequently saw it passing in the woods between the Bystraja brooks and the watershed of the streams on the south-east corner of Lake Baikal." Col. Przevalsky observed it in the Muni-ul mountains in Mongolia, and says that it breeds in the Ussuri country. In the valley of the Yenesay Mr. Seebold did not meet with it, owing probably to the country not being suited to its habits, for both to the east and west of that region it ranges far to the north.

It is a winter resident in the Mediterranean and in the south of Europe generally, but its numbers, as is the case in Great Britain, vary according to the weather which prevails each season. The Albanian coast is proverbial for the excellent Woodcock-shooting which it affords; and in Thessaly and Macedonia, Messrs. Elwes and Buckley write that very good sport may be had in some seasons. Mr. A. B. Brooke, writing in 'The Ibis,' 1873, remarks that it was more numerous in Sardinia formerly than at that time. In Corsica Mr. Bygrave Wharton did not find it common in 1875 on the west coast; but he remarks that it was said to be more abundant on the eastern side. Mr. Saunders speaks of it as common in the south of Spain; and writing of the Gibraltar district Col. Irby remarks as follows:—"Uncertain, both in numbers and as to time of arrival near Gibraltar, in some seasons Woodcocks are tolerably plentiful, as in 1873; in others, as in the winter of 1871-72, they are very scarce." He further observes:—"My earliest note of the arrival of a Woodcock about Gibraltar was on the 17th October, but very few arrive until the middle of November. The latest noticed was on the 8th of March; but I have seen them in Seville market on the 22nd of that month."

Von Heuglin gives the limit of its normal breeding-grounds between 42° north lat. and the polar circle in Europe. In Transylvania they are, write Messrs. Danford and Harvie Brown, generally common, arriving from the south in March and April, and after staying a short time in the low country they proceed into the mountains to breed. As is well known to many people in England, the Woodcock breeds in nearly every county, a favourite resort in the extreme south being the New Forest. In Scotland it is much more common, and in the nesting-season numbers breed in Rosshire and Sutherlandshire, Mr. More citing Perthshire as the district down to which it nests regularly. It is a question what becomes of the Woodcocks bred in England in the spring, as they are not seen in the summer and early autumn. The natural inference would be that, as it is a migrant, nesting, as a rule, in countries south of where it is bred, our English birds must migrate to southern parts after the young are flown. I am not aware, however, that any summer birds are ever seen on passage in any part of Western Europe; and we must either believe that they are all killed off in England or move northwards at night towards Norway and Sweden, to which country they could easily escape without being noticed. In Scandinavia it is very abundant during the breeding-season, and very many breed in Finland. It has been observed as far north as Tromsö, and is known to have strayed across to the Faroe Islands.

Lastly, looking to Africa, we find Favier, as quoted by Col. Irby, stating that the Woodcock is not abundant round Tangier, arriving during November and departing in March. Mr. Tyrwhitt Drake, however,

says that it is common in Morocco in winter. In Egypt, according to Captain Shelley, it is only a straggler; he mentions the occurrence of one individual in the Delta of the Nile. It is, however, evidently more numerous at some seasons than others; for Von Heuglin met with it in March in overgrown gardens near Alexandria and Rosetta, and also in the neighbourhood of Cairo, where it frequents vegetable-fields which are intersected with dykes and watercourses. In North-eastern Africa he never observed it. According to Naumann it has been met with in Senegambia and on the Gold Coast. In Madeira and the Canaries it is, according to Mr. Godman, a resident, breeding in all the islands sparingly, and inhabiting high wooded ravines. This gentleman likewise records it as stationary in the Azores, being not uncommon throughout the group, and most abundant in St. George's, Pico, and Flores, where it breeds in March.

It is interesting to know that it has strayed on two occasions across the Atlantic. On the 9th January, 1862, one was killed in Newfoundland; and Mr. G. N. Lawrence speaks of another specimen which was bought in a market as far back as 1859, and was believed to have been killed near Shrewsbury, New Jersey. It has, notwithstanding, never been recorded from either Greenland or Iceland.

Habits.—In India the wooded ranges of the south of the peninsula and the slopes of the Himalayas abound with spots which the Woodcock delights in—damp nullahs drained by numerous streams, which now and then in their course create little marshy spots, overgrown with rank vegetation and thorny shrubs, or on the sides of which moist soil furnishes good “boring”-ground; here and on the outskirts of woods, particularly where the soil is spongy and holds plenty of cover, they are to be found. But though they delight in such secluded ravines and feed on the borders of sylvan streams, they may be found in the daytime, when they are not feeding, in woods on the sides of hills, and in plantations far removed from water. In northern countries they are partial to sheltered larch- and spruce-woods and to thick “oak cover,” such as may be seen clothing the sides of narrow valleys in Cornwall, than which there is no better situation for the Woodcock to be found in England. They like woods where the soil is soft and free, and in which, though they are not on the alert for food, they can, during their time of repose, now and then indulge in a “bore.”

At sunset they sally forth from their hiding-places, no doubt wandering over a large area of country during the night in search of suitable spots to feed in; and when localities are found containing an abundance of food they naturally remain in them after dawn and continue to feed during the morning. The eye of the Woodcock is eminently suited for its nocturnal habits; it is enormous, the orbital cavities occupying two thirds of the whole skull and leaving but a small cranial space, so that in the dead bird what appears to be all head is, for the most part, eye. The Woodcock is an unsociable bird; it lives apart from its kind, is almost always flushed singly; and when a number are found in one wood together, the cause of their union lies in local abundance of food, and not in any social propensities, as will appear from their being found in only scattered company. Their chief food consists of worms, of which they are said to eat enormous quantities; and the assertion of Montagu that it would be constant labour for one person to procure food for two or three Woodcocks is corroborated by Mr. Hancock, who writes, in his ‘Catalogue of the Birds of Northumberland,’ of a gentleman who reared three, the supplying of which with worms constantly occupied one man. I have myself found small colcopterous insects in the stomach of this bird, mixed with vegetable matter, which appears to form itself into hard globular masses previous to ejection, having somewhat the appearance of Owl-castings.

The Woodcock is in general a silent species; but during the breeding-season it makes, while on the wing, a singular note, which Mr. Hancock likens to a “shrill chirp, produced twice, or rather a sort of squeak, like that made with a corkscrew when entering the cork—a noise to set the teeth on edge.” Another noise, which is likewise made on the wing, this naturalist calls a kind of croaking, of no long duration, but repeated at intervals. He writes as follows concerning these interesting sounds:—“On one occasion, in Norway, we heard them most distinctly, the Woodcocks all the time flying to and fro in the twilight, about 10 o’clock, P.M., over the tops of the trees of the wood where they were nesting. On another occasion we heard them with equal distinctness near Dunrobin, Sutherlandshire; this was the 19th of May, 1849, and likewise in the evening, the birds all the while flying backwards and forwards over the tops of the trees, not far from the spot where we found a nest. Unfortunately on neither occasion had we a sufficiently clear view of the birds to see if the croaking sound was accompanied by any quivering motion of the wings. Therefore I can

only conjecture how it is produced; but from the character of the sound itself it is certainly akin to that made by the Snipe."

The great depth of the sternal keel and consequent size of the pectoral muscles, together with the size of the head, render the Woodcock a heavy bird; and on the ground it is by no means agile as compared with other members of the Scolopacidae. It stands with the breast somewhat drooping, owing to its structure, combined with the rather backward position of the legs; and when it runs it proceeds with a waddling gait, resembling that of a Duck, getting, however, over the ground with no little speed when it has been winged and is pursued. It has been contended (and much has been written on the subject in the 'Field' newspaper) that it "rises from its bill," employing it as a lever against the ground at the moment of its taking flight. This may be so; but I imagine it is an optical illusion, which can be accounted for when we consider that rising suddenly from a state of rest, as is its habit, its heavy body and head and the shortness and backward position of its legs would naturally combine together to cause the whole frame to dip forward when the wings are quickly uplifted; and as the normal position of the bill is pointing downwards, the tip would almost touch the ground were the head jerked forwards. By carefully examining the ground at the spot from which a bird rose the impression of the tip of the bill could be discovered were this expedient really resorted to by the bird, and thus the matter would be settled. I am not aware whether this has ever been done. When Woodcocks are flushed on the side of a hill they almost invariably fly down the slope; their flight is moderately quick, somewhat irregular, and performed with heavy flappings of the pinions, between which there is often a perceptible interval longer than the rest. When suddenly surprised the Woodcock sometimes resorts to a singular expedient of concealment. It squats on the ground, and throwing back its head erects its bill quite perpendicularly, so that it looks like a short stick. A friend of mine, who once caught sight of one in this position when snow was lying in the cover, informs me that it was most difficult to distinguish it from the surrounding objects as it squatted on the snow with its bill erect and completely motionless.

In former days Woodcocks were caught in numbers in snares: the following paragraph in Montagu's 'Dictionary' relates to the method of their capture:—"Springers are usually set in moist places on the verge of woods, especially where the fowler perceives perforations made by the bill of the Woodcock, termed borings. . . . In such places a common ground-spring is formed of an elastic stick, to which is fastened a horseshair noose, which is put through a hole in a peg fastened into the ground, to which a trigger is annexed; and in order to compel the Woodcock to walk into the trap an extended fence is made on each side by small sticks set up close enough to prevent the bird passing between; these concentrate at the trap, so that in this funnel-shaped fence the Woodcock on feeding is compelled to pass through the narrow passage, and is almost to a certainty caught by the legs."

In the north of England, where the Woodcocks resort to moist places in the open fells to feed, it is a common practice with fowlers to build a little wall or row of stones, about 10 inches in height, across or alongside some ascertained feeding-place; and in this wall a narrow opening is left in which a horseshair noose is placed, of the same description as that above described. When the Woodcock, in walking about in search of its food, comes to the wall it runs along it until it finds the opening, through which it invariably passes, and is secured by the legs in the noose set for it. Mr. Seebohm informs me that the Ost'-yaks adopt precisely the same method of catching Sandpipers on the Yenesay, making their "walls" of drift-wood or any substance they can lay hands on. In the west of England it is caught in glade-nets, which are spread across narrow glades, down which it flies on coming out into the open to feed.

One of the most interesting habits of this beautiful bird is the practice of flying backwards and forwards in the breeding-season over a particular line of country in the evening and morning before going to and returning from its feeding-grounds. This is called "rôding;" and during it is on the wing it utters its peculiar notes. A Scandinavian author, Mr. Ekström, has written an interesting account of this habit, extracts from which are given in Mr. Lloyd's work on the game-birds of Scandinavia, and portions of which I here subjoin:—"During its morning and evening flights at this time, the Woodcock gives utterance to a peculiar call-note, which sportsmen express by *knort*, *knort*, *knisp*, or more properly, perhaps, by *orrt*, *orrt*, *pisp*. The first, *knort* or *orrt*, is a hollow, coarse, and somewhat lengthened nasal sound; the second, *knisp* or *pisp*, a short,

fine, and sharp sort of whistle, which, when one is accustomed to it, may be heard at a considerable distance. This note clearly appears to be one by which the betrothed invite each other to pairing; for the bird seems to pay very little attention to the *orrt*, but always listens and looks about it as soon as it hears the *pisp*. When two Woodcocks whilst rôding meet, or come into near proximity, they chase each other; and whilst casting themselves with the rapidity of lightning amongst the trees and bushes, even to the very ground, they give quick and hurried utterance to their finer note *pisp*."

The line of country over which the Woodcock rôdes is termed the *drag* in Swedish; and by taking up a favourable position in one of these *drags* numbers of birds are shot by Scandinavian sportsmen. When the weather is raw and cold, with a drizzling rain, the Woodcock is said by Mr. Ekström to rôde best; and concerning the above mode of killing them he writes:—"During the first days of spring the Woodcock commences rôding the instant the sun has sunk below the horizon, but at a more advanced period somewhat before its total disappearance, and continues until nightfall. In the morning it begins rôding whilst still quite dark, and ceases previous to its being full daylight. When the bird rôdes there is always an interval between each *tour* and *retour*, which is more observable in the evening, when it goes and returns three times. The first time it always flies high, and generally with rapidity; the second, its flight is but little above the tree-tops, and commonly slower; the third time still nearer the ground, and yet more leisurely; but it is then, especially in early spring, too dark to take proper aim. One ought, therefore, always to fire when it makes its appearance for the second time."

The migration of the Woodcock takes place at night; and Selby noticed that most birds arrive in misty calm nights, a fact which subsequent observation is said fully to bear out.

Nidification.—This bird breeds only in the Himalayas within the Indian limits. It has been observed "rôding" in Sikhim; and my late friend, Mr. A. Anderson, found its nest in the upper valleys of Kumaon at an elevation of about 10,000 feet, and was fortunate enough to secure the eggs, almost the only specimens ever preserved in India. From his interesting notes on the occurrence, contained in 'Stray Feathers,' 1875, I transcribe the following passage:—"We were following up a huge wounded *Presbytes schistaceus* through a dense undergrowth of Ringalls when a Woodcock rose close to us, dropping again almost immediately and disappearing in the cover. A diligent search revealed the long looked-for prize, four eggs, which were deposited in a slight depression in the damp soil, and imbedded amongst a lot of wet leaves, the *thin* ends pointing *inwards* and *downwards* into the ground. The eggs found (I could see they were hard-set) I told Triphook I had no intention of leaving the place without bagging the bird. It was raining heavily and bitterly cold, with the thermometer down to 40°; but fortunately for us, before we had time to make ourselves comfortable under an adjoining tree, the bird flew back in a sort of semicircle, alighted, and ran on to her nest. No sooner down than she was off again, frightened, as I subsequently learnt, at one of our dogs, but which, at first thought, alarmed me not a little, as I thought she was removing her eggs." After alluding to the shooting of the bird by Dr. Triphook, he describes the eggs, which are stated to be "darker and redder than the usual run of Woodcock's eggs, all four resembling the second figure in Hewitson's work, and in the character of their markings not unlike richly coloured specimens of Tern's eggs."

The nest is often placed near the foot of a tree, and sometimes among braekens, the dried fronds of which are used to line the depression in the soil which the bird scrapes; it is not usually concealed with any care unless it is placed in woods containing heather, when it is said to be difficult to find. Nidification in England and Europe is commenced in April and continued through May. The eggs are almost always four in number, and differ from those of its family in their round shape. In a small series from England and Sweden, for the examination of which I am indebted to Mr. Seebohm, the ground-colour varies from stony white to buff stone-colour; they are broad ovals in shape, some more pointed than others at the small end. The markings consist of rather large and small blotches of reddish brown, openly scattered over the surface, but chiefly collected round the large end, and under which lie blots of pale bluish grey. In one egg the markings are smaller and thicker. Two Swedish eggs measure 1.68 by 1.32 inch and 1.68 by 1.3; and one from Sherwood Forest 1.75 by 1.34 inch.

It is well known that the Woodcock carries its young from the nest to the feeding-grounds, and it has been thought by some that in order to accomplish this it grasps them in its feet. It is easy, however,

to perceive that the toes of a Wader are not adapted for holding any thing as bulky as a young bird. Mr. Hancock publishes some interesting notes on the subject in his 'Catalogue,' and demonstrates, for the first time I believe, the real mode in which the nestling is carried. He writes:—"In 1849 I accompanied Mr. St. John to Sutherlandshire, on an ornithological tour, and had the good fortune to observe the Woodcock perform this feat. As we were rambling in the neighbourhood of Dunrobin, where it nests regularly, we raised the bird, and at once saw the young suspended beneath the body of the parent. It was close to us when it rose, so that we had an excellent view of both the young and the old bird. 'Now,' said Mr. St. John, 'are you not convinced?' 'Yes,' I replied, 'that the young is carried, but not in the claws, which I have said, and still believe, are too feeble for the purpose.' I picked up one of the brood; it was about the size of a Snipe; when I grasped it, it made a peculiar squeaking noise. In the course of half an hour we returned to the spot and again witnessed the old bird carry off another of its chicks, and now became quite satisfied of the *modus operandi*; the young bird was pressed close up to the breast of the parent, as indeed was obvious in the first instance. Hence the inference of us both that the young was held between the legs and not in the claws." It is possible that when surprised the parent bird may seize its young with the toes; but that it does not succeed in carrying it far by this means, has been proved by an extract from the 'Lays of the Deer Forest,' published, with other information on this subject, by Mr. Harting. In this we are told that a Woodcock rose with a young bird in her feet dangling and swinging like a parachute, but that she alighted at no great distance, and getting up again dropped the bird; we are then informed that she rose again "with him in her claws;" but the inference to be drawn from her previous failures is that, in the last instance, the observations of the author were not accurate, and that at the third trial the young bird was carried between the legs.

Genus GALLINAGO.

Bill as in *Scolopax*, but with numerous pinnules near the tip. Wings with the secondaries usually shorter. Tail short and variable, of from 12 to 28 feathers; the lateral ones in some very narrow and stiff. Legs proportionately longer than in *Scolopax*. Tarsus bare above the knee; the hind toe longer and with a well-developed nail.

GALLINAGO NEMORICOLA.

(THE WOOD-SNIPE.)

Scolopax nemoricola, Hodgs. J. A. S. 1837, vi. p. 490; Jerdon, Cat. B. S. India, Madr. Journ. 1840, xii. no. 336; Ill. Ind. Orn. pl. 9 (1847); Nevill, J. A. S. (Ceylon Branch), 1867-70, p. 138 (first record from Ceylon).

Nemoricola nipalensis, Hodgs. J. A. S. 1837, vi. p. 491.

Gallinago nemoricola (Hodgs.), Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Jerdon, B. of Ind. iii. p. 672 (1864); Holdsw. P. Z. S. 1872, p. 473; Legge, J. A. S. (Ceylon Branch), 1873, pp. 67, 68; Hume, Str. Feath. 1878 (B. of Tenass.), p. 459; id. *ibid.* 1879 (List Ind. Birds), p. 112.

Adult (Nepal: British Museum). Wing 5·6 to 5·8 inches; tail 2·8; tarsus 1·4 to 1·6; bare tibia 0·3; bill to gape 2·6, at front 2·8; middle toe 1·5.

Jerdon's data are:—"Length 12·5 to 13·0 inches; wing 5·75, expanse 18·0; tail 2·5; bill at front 2 $\frac{2}{3}$; tarsus 1·75. Average weight 5 $\frac{1}{4}$ to 7 oz."

The bill is high at the base in this species, and the tail has from 16 to 18 feathers.

"Iris dusky brown; bill reddish brown, paler at the base beneath; legs plumbeous green." (*Jerdon.*)

Head and nape shining brownish black, with only a partially developed central stripe; lores, front part of face, and chin buffy white, with a broad black stripe from the gape to the eye; a buff supercilium joining the white of the lores, and spreading behind the black ear-coverts over the sides of the nape, where the feathers are mingled with black; hind neck, interscapulars, and scapulars glossy brown-black; outer side of most of the scapular and intervening feathers with a broad rich buff margin and an oblique rufous-buff bar; wing-coverts and tertials dull brown, barred with rufous-buff; primaries, their coverts, and the secondaries plain brown; the primary-coverts tipped with whitish; back and rump blackish brown, the feathers tipped with dusky buff; upper tail-coverts rufous-buff, barred with brown; six central tail-feathers black at the base, with a rich rufous terminal band, tipped paler and crossed with dark rays near the extremities; remaining feathers brown, barred with dull rufous and pale tipped; upper part of fore neck dark brown, the feathers margined with dusky buff, increasing on the chest, and the brown portion gradually turning into bars; all the under surface dull white, rather closely barred with brown; under wing-coverts brown, barred with white; axillaries dark brown, narrowly barred with white.

Obs. This fine Snipe has no real resemblance to the last species; but on account of its large size, ample wings, dark plumage, short legs, and stout bill seems sometimes to be mistaken for the "Cock" in eastern parts by those who are not familiar with the latter bird. On picking up the bird a momentary glance at the underpart of the wing (which will no doubt catch the eye), on which *no bars will be seen*, will, together with the appearance of the legs, which are bare for a little distance above the knee, at once distinguish it from the Woodcock.

The only other large member of the genus in India is the Himalayan Solitary Snipe. It is about the same size as the present species, but longer in the wing, *pure white on the throat* and under surface, and has five stiff and narrow feathers on each side of the tail; the primaries are tipped and edged outwardly with white, and the tertials are barred with light rufous; the bill is more slender, and the bird is shorter in the leg than the Wood-Snipe. A Nepalese example before me measures:—wing 6·2 inches; tail 2·8; tarsus 1·25; middle toe 1·3; bill to gape 2·7, at front 2·8.

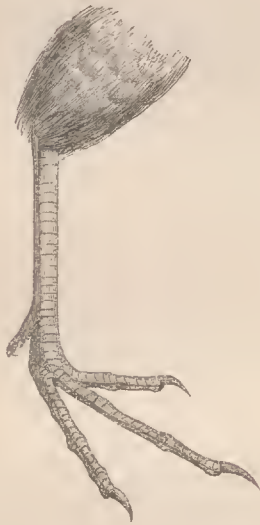
Distribution.—This fine Snipe was first recorded as having occurred in Ceylon by Mr. Hugh Nevill, of the Ceylon Civil Service, a gentleman who has devoted much attention to the ornithology of the island. He gives no particulars as to season or date of its discovery, or by whom procured, but merely says that it is found in "the country round Nuwara Eliya." It is possible that some of the accounts of the occurrence of the Woodcock in this region which are from time to time given by sportsmen may have in reality referred to this bird; on the other hand it may be only a very rare straggler in the cool season from the Nilghiris, which hills it inhabits in fair numbers. It is to be presumed that the time of its occurrence at Nuwara Eliya was during the cool season, for it cannot well be a resident in Ceylon.

Concerning its distribution in India, we do not learn much from any author, save Jerdon, who writes as follows :—"This Solitary or Wood-Snipe is found in the Himalayas, the Nilghiris, Coorg, and occasionally in the Wynaad, and other elevated regions of Southern India and Ceylon (?) ; it is also said to occur in considerable numbers in the Sharunpoor district below Hurdwar, and generally in the extensive swamps at the foot of the Himalayas It is by no means common or abundant anywhere, and on the Nilghiris but few couples are shot in general in one season." Hodgson procured it in Nepal, whence there are specimens of his in the national collection. I find no record of it from the south of India in the writings of observers in 'Stray Feathers;' but we have Mr. Hume's authority that Mr. Davison has frequently shot it in the Nilghiris.

It has lately been recorded from Tenasserim; and its occurrence there has considerably extended its hitherto solely Indian habitat. Mr. Hume's note of it is :—"Davison flushed a specimen of this species in a bit of thick jungle on the banks of a little stream near Malewoun. He has shot numbers of this species on the Nilghiris, and is, he says, perfectly certain of the identification."

Habits.—The Wood-Snipe is an inhabitant, as its name implies, of jungle, being found in damp spots on the borders of forest, in swampy brushwood, near streams flowing through woods, &c. Jerdon remarks that "it flies heavily, and, having a large expanse of wing, is not unfrequently taken for a Woodcock." Mr. Nevill notes that it is found in Ceylon "among low bushes at the edge of swampy patna-lands." I am unable to furnish any detailed information concerning its habits, as I have never met with it myself; nor am I able to speak of its nidification, as no data touching it have as yet been published.

The accompanying woodcuts illustrate the difference in the legs of this species and the Woodcock, and are given for the information of local students.



Leg and foot of *Scolopax rusticula*.



Leg and foot of *Gallinago nemoricola*.

GALLINAGO STENURA*.

(THE PIN-TAILED SNIPE.)

Scolopax gallinago, Horsf. Trans. Linn. Soc. xiii. p. 191 (1821, *nec* Linn.).

Scolopax sthenura (Kuhl), Bonap. Annali di Storia naturale, Bologna, iii. fasc. 14, "Sund Islands" (1830).

Scolopax horsfieldi, G. R. Gray, Ill. Ind. Zool. pl. 54. fig. 2 (1834).

Scolopax biclavata, Hodgs. P. Z. S. 1837, p. 491.

Gallinago stenura (*nec* Temm.), Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Kelaart, Pro-dromus, Cat. p. 135; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 674 (1864); Schlegel, Mus. P.-B. *Scolopaccs*, p. 12 (1864); Swinh. Ibis, 1870, p. 302; Holdsw. P. Z. S. 1872, p. 473; Hume & Marshall, Str. Feath. 1873, p. 423; Legge, J. A. S. (Ceylon Branch), p. 52 (1874); Salvadori, Uccelli di Borneo, p. 334 (1874); Hume, Str. Feath. 1874, p. 294; Parker, *t. c.* p. 335; Ball, *t. c.* p. 431; Armstrong, *ibid.* 1876, p. 340; Inglis, *ibid.* 1877, p. 46; Butler & Hume, *t. c.* pp. 212, 213; Sharpe, Ibis, 1877, p. 24; Tweeddale, P. Z. S. 1877, p. 550; Seebohm, Ibis, 1879, p. 155.

Scolopax indica, Licht. Nomencl. p. 93 (1854, *nec* Hodgs.).

Gallinago horsfieldi (Gr.), Swinhoe, P. Z. S. 1871, p. 407; Hume, Str. Feath. 1875, p. 182.

Gallinago sthenura (Kuhl), Le Messurier, Str. Feath. 1875, p. 380; Hume, *ibid.* (List B. of Tenass.), 1878, p. 459; Davidson & Wender, *ibid.* vii. p. 88; Ball, *t. c.* p. 320; Cripps, *t. c.* p. 301; Hume, *ibid.* 1879 (List B. Malay Pen.), p. 69; *id. t. c.* (List B. of India), p. 112.

Horsfield's Indian Snipe, Kelaart; *The Indian Snipe* of some; *Snipe*, Sportsmen in Ceylon. *Boorkat Gardung*, Malay; *Sekadidi*, Sumatra; *Burchet*, Java (Horsf.); *Narsya Snip*, Dutch in Ceylon (MacVicar); *Ulan kuruvi*, Ceylonese Tamils; also *Kora Kotu*, Coolies in Central Prov.

Kæswatuwa, Sinhalese.

Adult male and female. Length 9.5 to 10.5 inches; wing 5.2 to 5.5; tail 1.8; tarsus 1.25 to 1.3; middle toe and claw 1.5 to 1.55; bill at front 2.3 to 2.65, average 2.4 to 2.5. "Average weight 4 oz. 3 drachms" (Parker, Str. Feath. ii. p. 335).

Females are the larger of the two sexes.

Iris deep brown; bill, upper mandible blackish, paling to dark olive at the tip, lower basal half olive-green, darkening to brownish at the tip; legs and feet olive-green, some darker than others.

Crown, occiput, interscapulars, and scapulars velvet-black; the face, throat, supercilium, mesial head-stripe, broad lateral edges of upper back, and scapulars buff; scapulars boldly barred and striped and the head-feathers tipped with rich rufous; hind neck, back, and wing-coverts blackish brown, the former with margins, and the back and coverts with bars and tips of ochraceous grey and buff-whitish; least wing-coverts narrowly edged pale; primaries and their coverts and the secondaries dark brown, the primary-coverts and secondaries tipped with white; tertials barred with rich brown and fulvous yellow; tail with the broad feathers black, crossed by a wide subterminal band of rufous-yellow, and tipped with whitish, the stiff lateral feathers (usually six on each side) brown, with white tips; a

* Although this specific name was originally spelt *sthenura*, it is incorrect, as the idea of narrowness in the lateral tail-feathers, and not strength, is meant to be implied. *Στερός*, meaning "narrow" (in contradistinction to *σθερός*, strength), indicates the correct spelling.

brown stripe from gape, passing beneath the eye to the ear-coverts; another on the cheeks; fore neck and chest fulvons, the basal portion of the feathers barred with brown; breast and lower parts white, the flanks barred with brown; thigh-coverts with the bases brown; under tail-coverts buff, obliquely barred with dark brown; axillaries and under wing-coverts white, *closely barred* with brownish black.

Summer plumage (Yenesay, 10th June, 1877). Markings of the upper surface yellower than in winter. Black portions of the feathers of the head and back more intense than in my winter specimens, and the wavy rufous-buff markings of the scapulars and tertials richer. There is a very slight green gloss on the black feathers, which tint has been said to characterize the summer dress. The throat and lores are somewhat whiter than in winter specimens; but I am not aware that this feature is constant. The measurements of this specimen, which is a male, are:—wing 5·1 inches; tail 2·1; tarsus 1·3; middle toe 1·3; bill to gape 2·38.

Specimens that I have shot in May, as they were migrating, I have noticed to have the dark parts of the scapulars, back, and tertials just perceptibly glossed with green, and the colour blacker than in winter.

Young. I have no information as to the coloration of the chick; but it is reasonable to infer that it must resemble that of the next species, which will be found described.

Obs. It is not necessary to remark on Indian examples, which are one and the same stock as Ceylonese. A singular feature in this species is the variable number of “pin” tail-feathers. Although six is the normal number on each side, yet seven and even nine have been detected on careful examination, and Swinhoe speaks of a specimen with only four. The weight given above is that of a series of Indian examples weighed by Mr. Parker, and recorded in ‘Stray Feathers;’ it depends greatly on the condition the bird is in. The present species is, however, a bulky bird in all respects, both as to body and bill, and weighs on the average more than the European Snipe. Measurements taken in India are as follows:—*Females*: length 10·62 to 10·87 inches; wing 5·18 to 5·25, expanse 17·5 to 17·87; bill at front 2·5 to 2·62 (*Butler*). *Females*: wing 5·08 (?), expanse 17·62 to 18·0; bill at front 2·5 to 2·54 (*Cripps*). The wing-dimension is small in both cases; in the latter, judging from the “expanse,” there would seem to be an error.

An allied species to the present is Swinhoe’s *G. megala*, called by this author the “Spring Snipe” of China. It differs in having the stiff lateral tail-feathers broader and coloured with rufescent white; they are also fewer in number. An example before me has five of these feathers on each side; they are barred and “indented” with black; the two outer feathers on each side are the only ones that are really narrow, being 0·1 and 0·2 inch across; the upper and under tail-coverts are rufescent; the under wing-coverts and axillaries are broadly barred with black on an impure white ground-colour. Its describer pronounced it as larger than *G. stenura*; but I question whether it much exceeds this latter. The example above alluded to measures 5·4 inches in the wing, tarsus 1·35, bill at front 2·45, which dimensions do not exceed that of an average-sized “Pin-tail.”

Distribution.—The Pin-tailed Snipe visits the island of Ceylon in vast numbers, arriving in September, either early or late, according to season. I have heard it remarked that in wet years it arrives earlier than when the weather has been very dry. Such a local cause, however, could scarcely influence its migration, unless the rain had been very constant on the mainland, when, finding the country in a suitable condition to harbour it and afford it food, it would naturally continue to move southwards more speedily than if the contrary were the case. Last year (1878), which was exceptionally wet in Ceylon, saw them earlier to the fore than any other since my arrival in the island in 1868; and their occurrence in the Colombo district on the 1st September was reported by the local newspapers. In 1872 I met with Snipe in the neighbourhood of Galle on the 10th September; and this is the date when they may generally be looked for on the west coast. They do not appear to locate themselves so early in the north-eastern parts of the island, for at one of their greatest haunts in Ceylon (the Tamblegam district) there are scarcely any Snipe before the middle of October, and the shooting is, as a rule, poor up to the end of November. They are diffused over the whole of the low country, and are most abundant in large paddy-fields near jungle, and in marshy land surrounding the tanks of the northern and eastern provinces. In the western portion of the island the best Snipe-grounds are at Jayelle, near Vean-godde, in the Kurunegala district, on the borders of the Bolgodde Lake, on the banks of the Bentota river, the paddy-land between Waekwella and Baddegama, and the marshy lands in the Matara district. In the interior of the south-western part of the island I have met with more Snipe in the wild secluded fields near Oodogamma than anywhere else. Indeed it is in these out-of-the-way places where Snipe congregate most, for

they are seldom visited by European sportsmen; and the only danger the birds have to fear is at the hands of the wily Singhalese gunner, who not unfrequently "pots" them in the early morning, before they have ceased to feed and seek concealment in the grass. But unless the villager is near enough to a market to be able to bring in the *Keswatunwa* he shoots for sale, I do not think that he cares to waste his powder and shot on them. I must remark, however, in justice to native prowess, that occasionally Singhalese are to be found who can render a moderate account of Snipe on the wing.

Throughout the south-eastern districts, where there are tanks or freshwater marshes, Snipe are abundant. At Sittrawella, near Kiriude, I found them on one occasion in great numbers. There are other favourite haunts in the Yāla district; and I believe the great Moorish rice-fields, irrigated by the waters of the Ambaré and other tanks, form an excellent Snipe-ground. I have already alluded to the neighbourhood of Tangle-gam bay, which is one of the best grounds in the island, and there are other excellent spots both in the interior and on the north-east coast. In the Anaradhapura and Vavonia-Velankulam districts they are generally abundant, as also in the Jaffna peninsula.

From the low country the Snipe finds its way into those portions of the hills where the locality is suitable to its habits; it affects the Dumbura paddy-lands and the terraced fields in all the Kandyan valleys; and during December and January great numbers frequent the Fort-Macdonald district, and furnish excellent sport for the planters of the surrounding neighbourhood. They are found on all the upland plains on the Nuwara-Eliya plateau, and are numerous on the Horton Plains, which form, of course, the highest Snipe-ground in the island.

About the middle of April the Snipe begin to move northward, and by the end of the month the majority have left the island. I have met with them in the Galle district as late as the 3rd of May, and have heard of their occurrence a little later than this. Some *few* birds *occasionally* remain in the island throughout the year; but these are evidently unfit for migration, owing to wounds, or, in some cases, they may be first-year birds, which, as in the case of other Waders, remain stationary the first year. There can be no other cause to make Snipe remain in such a tropical latitude as Ceylon.

On the mainland of India the Pin-tailed Snipe is most abundant in Lower Bengal, in portions of Central India, parts of the Deccan, the Carnatic, and the south of the peninsula generally. It is also numerous in Assam, Pegu, and the Rangoon district. These are the portions of Indian territory which it would naturally chiefly affect, seeing that it must of necessity enter India from its Central-Asian breeding-haunts by way of Assam and Northern Burmah; and the migratory stream would therefore flow down the eastern side of the empire and end in Ceylon.

Verifying these remarks, we find Mr. Hume noticing many specimens from Assam, Mr. Oates saying that it is the Common Snipe of Upper Pegu and very abundant at Tonghoo, and Dr. Armstrong recording it as very abundant in the Irrawaddy delta. Again, Mr. Inglis finds that it is extremely common in North-east Caehar, Captain Beavan testifies to its being more numerous than the European Snipe at Barrackpore, and Mr. Cripps to its being common in Furreedpore. It seems then to skip over a large tract of country in Chota Nagpur, which would seem to be tenanted chiefly by its European ally. Mr. Ball says he never met with it in the "division" in question, and only notes it from Manblum, I conclude, on Captain Beavan's authority; he, however, records it from the Godaveri valley. From the Mahabaleshwar district Dr. Fairbank does not notice it; and Messrs. Davidson and Wender say that it is not so common in the Deccan as *G. scolopacina*. In the Carnatic it is more abundant than the latter; and it is *the* Snipe of the Nilghiris. Mr. Bourdillon remarks that they are found at all elevations in the Travancore hills, and that they are more numerous at Trevandrum, in the plains, than the other species.

In Northern and Western India it is rather rare. Major Le Messurier and Mr. Blanford have recorded it in 'Stray Feathers' from Sindh, but no one else; and Captain Butler says that it is not common near Mount Aboo; he procured it at Milana and near Ahmedabad; and the date of its earliest arrival in this district is given as the 24th August. Captain Hayes Lloyd does not record it from Kattiawar.

Turning eastward again, to trace out its winter quarters in that direction, we find that it is common in suitable localities throughout Tenasserim, and was procured by Mr. Davison on the Pakchan, in the extreme south. In the Malay Peninsula it is recorded from Wellesley Province and Malacca; and at Singapore it was procured

by Peale. In the Andamans it is the commonest Snipe of the two species, and is very abundant at Aberdeen, South Andaman, and Mount Augusta. It was also observed by Mr. Hume in the Nicobars.

Swinhoe notes it as found throughout China, Hainan, and Formosa in winter. In Hainan he observed it until the end of April, and at Cheefoo he obtained it in May. About Pekin it is found, according to Père David, at the beginning and end of the summer. It was procured for the first time in the Philippines at Zamboanga by the 'Challenger' naturalists, and recorded by Lord Tweeddale in the P. Z. S. 1877. In Sumatra it was obtained by Raffles and S. Müller, and in Borneo by Schwaner, Doria and Beccari in Banjarmassing and Sarawak; and Mr. Everett recently obtained an example in February in the district of Sibiu. Mr. Wallace records it from Timor, which is the limit of its range to the south-east.

As regards the region to which it returns for breeding, this would seem to be Mongolia, the Lake-Baikal district, and Central and Eastern Siberia. It is not recorded from Turkestan, which shows that it does not migrate round the western end of the Snowy Range; but Col. Prjevalsky says it breeds in tolerable numbers on the Ussuri, and is more plentiful still during migration. In South-east Mongolia he found it rare, and did not observe it in the Hoang-ho valley or in Kan-su and Koko-nor.

Middendorff does not seem to have met with it in Siberia, and Schrenck does not record it from the Amoor; but in this region it has probably been overlooked, as Swinhoe has seen examples from Lake Baikal. Mr. Seebold, to whose kindness I am indebted for an examination of the above-mentioned example, procured this species in 1877 on the Yenesay, within the Arctic circle; and this is the most northerly point from which it has ever been recorded. He thus writes of it in his interesting paper on the birds of Siberia:—"The first Wader which arrived at our winter quarters on the Arctic circle was the Pin-tailed Snipe. We shot a couple on the 5th of June, three days after the ice began to break up on the great river. Three days later they were exceedingly common on the oases of bare grass which the sun had been able to make in a few favourable situations in the midst of the otherwise universal desert of melting snow."

Habits.—This Snipe, which may be called the eastern representative of the common species, resembles it very much in habits, differing from it simply in a few minor points. Like the latter it is a sociable and gregarious bird, frequenting (in Ceylon) paddy-fields, and by choice those which are grassy, weedy, and partially cultivated, the margins of tanks, rushy swamps, marshes interspersed with small jungle, and also the borders of rivers, where, unlike its European congener, it may sometimes be seen, more especially at the end of the season, running along the mud like a Sandpiper. Large tracts of ground which look admirably suited for it may be walked over and not a bird seen; other fields will then be entered upon where, to judge by a cursory glance, no Snipe would be likely to be met with, but in which all the birds in the neighbourhood will be found collected; and they rise one by one in scattered company, or in "wisps" or flocks of half a dozen to a score or more. A particular sort of vegetation, probably weeds overrunning the grass, and affording them excellent shelter, or an abundance of food in the immediate vicinity of their retreat, or even on the spot itself, will have been the cause of their reunion in the early morning from the feeding-grounds they have frequented during the night. Though not associating in close company, they are nevertheless sociable birds, for any favourable condition of food or concealment will bring them together; and they do not appear to object to the tolerably near proximity of their kind. In one small field of a few acres, which had been recently flooded, leaving the soil soft and muddy, and which was covered with a species of running-weed or vetch, forming a tangled mass or cloak of vegetation at about 6 inches above the ground, I once found many scores of Snipe. It was a piece of Snipe-ground *par excellence*; they could move about on the muddy ground, and bore to their heart's content beneath the canopy of weed without being seen. It has been said by some that the Pin-tailed Snipe does not frequent the same ground as the Common; but this depends entirely on the food searched for, and the locality in which it is found. When feeding it may be met with in all kinds of marshy damp situations, where the soil is favourable for "boring;" but when not feeding it is true it will settle down in places unlike those chosen by the Common Snipe. In the low country it retreats into the jungle during the heat of the day, and may be flushed from beneath bushes, the sides of paths, or even from little sandy plots surrounded by trees. On the upland patuas of Ceylon it is often found resting on dry rising ground, as if the low-lying feeding-grounds were too damp and cold for it. I have also put them up in dry grass-fields resting on dead leaves; but these instances are those of birds which have been disturbed; and when once a Snipe is driven out of its retreat it will settle down anywhere.

This species feeds almost entirely on aquatic insects of various size; for I have found small Coleoptera in the stomachs of some I have examined; and in India caterpillars have been found occasionally; and when at the close of the season they frequent mud banks, where I have seen them on the Gindurah river, they no doubt feed on mollusks and crustacea. Mr. Davison writes to Mr. Hume of a Pin-tailed Snipe seen in the Andamans:—"On the 27th of December I saw one of these birds feeding on the shore about 2 P.M. It was running hither and thither, like an *Actitis*" (Sandpiper). It would have been interesting to have examined the stomach of this bird and recorded its contents.

The note of this species is a *sc-ape* or *ps-ape*, like that of the Common Snipe, but not quite so harsh in sound. Its flight, when it happens to be "wild," is just as swift, though perhaps a little steadier. When found in quiet unfrequented spots, where it is sometimes very tame, it lies close and flies sluggishly for a short distance; and I have even seen it rise trailing its legs like a Rail. I have noticed this occur on very hot afternoons, when the bird has in all probability been feeding undisturbed during the morning, and has become thoroughly satiated and lazy. When running they project the neck forward and droop the bill slightly; and the movement of their legs is not swift, as those of a Sandpiper.

The Pin-tailed Snipe affords excellent shooting; and there is, in fact, no other bird-sport to be had in the island, as the Bush-Quail are not abundant enough, and the Red-legged Partridges, as we have seen, are confined to certain localities. The largest bags are made in the Trincomalie and Kurunegala districts, in the former of which, during my residence in the island, 71½ couple were on one occasion killed by an officer, Lieut. Preston, of the 73rd Regiment. I am under the impression that as great a number have been killed to one gun in the neighbourhood of Kurunegala; but I am not in possession of data to enable me to speak positively.

Nidification.—The only information we have concerning the breeding of this species is from the pens of Col. Prjevalsky and Mr. Seebohm. With reference to the Ussuri river, where it nests in the month of April, the former writes ('Birds of Mongolia') :—"In the latter half of April the birds choose their nesting-localities in the thinly overgrown marshes, and their peculiar courting commences. Rising into the air, similar to our *G. scolopacina*, and describing large circles above the spot where the female is sitting, it suddenly dashes downwards with great noise (which is most likely produced by the tail-feathers, like that made by our species, and somewhat resembles the noise of a broken rocket). As the bird approaches the ground the noise increases, until it has got within a hundred yards, when it suddenly stops the sound, and quietly flies on, uttering a note something like '*tiric, tiric, tiric.*' Courtship lasts until the middle of June, and is mostly heard or seen in the mornings and evenings, but occasionally in the daytime, and even at night in clear weather." Mr. Seebohm met with it on the Arctic circle, and observes (Ibis, 1879, p. 155) as follows :—"They used to come wheeling round, uttering a loud and rather shrill cry (some idea of which may be gathered by the sound of the word *peezh*, long drawn out); then they used to drop down with a great whirr of wings, and with tail outspread—an operation which seemed so engrossing that they appeared seldom to discover until they were on the ground that they had chosen a spot to alight within twenty yards of a man with a gun. It was amusing to see them find out their mistake. Sometimes as soon as they caught my eye they would take wing and fly quietly away; but more often they would hurry off as fast as their legs could carry them, and hide behind a tuft of grass or a bush. I never heard the Pin-tailed Snipe 'drum,' as the Common Snipe often does, when wheeling round and round at a considerable height in the air; nor did I ever hear the *tyik-tyuk* so characteristic of the Common Snipe."

It is noteworthy that while one writer speaks so clearly of the drumming noise, the other did not hear it. Col. Prjevalsky, though he writes of the species under the name of *Gallinago heterocerca*, Cabanis, can refer to no other than the present bird, more particularly as the next species he notices is *G. megala*, which, together with the Pin-tailed Snipe, are the only species found in this region. Mr. Harting considers that *G. heterocerca*, Cab., = *G. megala*.

The discovery of the nest and eggs remains yet to reward the labours of some adventurous ornithologist in these northern regions.

GALLINAGO SCOLOPACINA*.

(THE COMMON SNIPE.)

Scolopax gallinago, Linn. Syst. Nat. i. p. 244 (1766); Gmelin, ed. Syst. Nat. i. p. 662 (1788); Gould, B. of Eur. iv. pl. 321 (1837); Middendorff, Sibir. Reise, ii. p. 224 (1853); Shrenck, Reisen und Forsch. Amur-L. p. 426 (1860); Seebohm & Harvie Brown, Ibis, 1876, p. 309; Anderson, Yunan Exp. p. 681 (1878).

? *Scolopax gallinaria*, Gmelin, ed. Syst. Nat. i. p. 662 (1788).

Gallinago media, apud Leach, Cat. M. & B. Brit. Mus. p. 31; Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 163; Godman, Ibis, 1866, p. 101; Shelley, B. of Egypt, p. 249 (1872).

Gallinago scolopacinus, Bonap. Comp. List B. Eur. & N. Amer. p. 52 (1838); id. Compt. Rend. xliii. p. 579 (1856); Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Kelaart, Prodromus, p. 110, et Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 674 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 4 (1864); Swinhoe, P. Z. S. 1871, p. 407; Holdsw. P. Z. S. 1872, p. 473; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1201 (1873); Legge, J. A. S. (Ceylon Branch), p. 70 (1873); Hume, Str. Feath. 1873, p. 235; Hancock, B. of Northumb. p. 105 (1874); Hume, Str. Feath. 1874, p. 295; Irby, B. of Gibraltar, p. 175 (1875); Hume, Nests and Eggs, iii. p. 580 (1875); id. Str. Feath. 1875, p. 182; Walden, Trans. Zool. Soc. ix. p. 235 (1875); Butler & Hume, Str. Feath. 1876, p. 15; Scully, *t. c.* p. 186; Fairbank, *t. c.* p. 263; Blanford, Zool. Persia, p. 282 (1876); Hume & Davison, Str. Feath. 1878 (B. of Tenass.), p. 459; Davidson & Wender, *ibid.* vii. p. 88; Ball, *t. c.* p. 228; Seebohm, Ibis, 1879, p. 156.

Gallinago gallinaria (Gm.), Cripps, Str. Feath. 1878, p. 302; Hume, *ibid.* 1879, p. 70 (List B. of Malay. Penin.); id. *t. c.* p. 112 (List B. of Ind.).

Bécassine, Buffon; *Gijach*, Welsh; *Agachadiza*, Spanish (Saunders); *Agachona*, Andalucia (Irby); *Maçanico real*, Azores (Godman). *Choseh*, *Chuschah*, Arabic (Von Heuglin); *Ji-shigi*, Japanese (Blakiston); *Ázzi*, Amuria (Schrenck); *Bou monkar*, lit. "Father of the bill," Moorish (Irby); *Bharka Bharak*, Hind., also *Chaha*; *Soorkhab*, lit. "Sucker of Water," of some Shikarees; *Muku puredi*, Telugu; *Chegga* Bengal.; *More-ulan*, Tamil; *Mah ramcki*, lit. "The Solitary One," Turki (Scully).

Kæs watuwa, Sinhalese.

Adult (Ceylon, Jan. 1873). Length 11·0 inches; wing 5·2; tarsus 1·17; tail 2·5; middle toe and claw 1·35; bill at front 2·66.

Iris dark brown; bill reddish brown, pale at the base beneath; legs and feet greyish green.

* The Linnean and oldest title of the Snipe cannot unfortunately be applied to it, as the specific name is the same as the now-employed generic one, the Snipes having very properly been removed from the genus *Scolopax*. As, therefore, the Stricklandian code forbids the use of the name *Gallinago gallinago*, the next oldest name is that of Bonaparte's, as Leach's prior title had been applied by Latham to the Great Snipe before its bestowal on the present species. With regard to Gmelin's name, *gallinaria*, previously applied by O. F. Müller (Zool. Dan. Prodr. p. 23, 1776), it can only be remarked that it cannot possibly apply to the Common Snipe, as the description runs, "*pedibus flavis, capite toto grisea, &c.*"

Adult female (Wales). Length 10·3 inches; wing 5·3; tail 2·4; tarsus 1·3; middle toe without claw 1·2; bill to gape 2·55; expanse 17·0. Weight 3½ oz.

This Snipe has 14 tail-feathers, and the lateral ones are not rigid, and but little narrower than the adjacent.

Obs. This species so closely resembles the last (to which I have given precedence as being the ordinary Snipe of the island), that it is only necessary to point out its distinguishing characteristics as follows:—

Winter plumage. Differs from the Pin-tailed Snipe in having a slenderer and, *on the whole*, a longer bill and shorter legs and feet; in wanting the narrow, rigid “pin”-feathers on each side of the tail; in having the axillaries barred with paler, narrower, and much more *distant* bars; in having the under wing-coverts along the edge of the wing much less barred, and the greater secondary series more or less uniform white, the brown bars being chiefly confined to the base; and in the *conspicuous white tips* to the secondaries. The lateral tail-feathers are white, with a black bar near the tip, and a broader band, chiefly on the inner web, near the base. The buff margins of the scapular feathers are perhaps, as a rule, broader; but this character is uncertain, and chiefly applies in summer plumage.

Summer plumage. This is characterized merely by a brighter and more glossy plumage. An example from the Yenesay (Arctic circle), collected by Mr. Seebohm, now before me, measures as follows:—wing 5·1 inches, tail 2·3, tarsus 1·25, bill at front 2·6; has the occipital and loreal stripes and the chin whiter than in winter specimens, and the black feathers of the back and scapulars glossed with green and more richly variegated with rufous-buff than in winter specimens; the broad lateral margins of the scapulars are almost white, instead of buff, which has the effect of setting off the black portions more clearly.

Young (nestling, in down: Brit. Mus.). Above deep ferruginous, mingled with black, and mottled on the head and back with white; a band of black and rufous passes from one eye to the other across the forehead, at the base of the bill, above which is a rufous-buff band surmounted by a black patch; the cheeks are white, below which, and on the ear-coverts, there is a black patch; chin and throat buff, crossed by two black bands, beneath the lower of which the fore neck is rufescent; lower parts paler; rump brownish, mottled with white. Bill to gape 0·58 inch. The nestling Snipe differs from the Woodcock in its darker ground-colour and white mottling, besides which the *bare tibia* would serve to identify it at once.

In an example about ten days old the black markings predominate over the rufous, the head is boldly marked with the white down, and the feathers have appeared on the hind neck and scapular regions, and are black, barred with rufous and edged with buff; the wing-coverts are likewise black, tipped with white. Bill 1·2 inch at gape. These remarks are based on a specimen in the national collection.

Immature birds in the first autumn closely resemble adults; but the buff markings are not so rich, the chest is not tinged so much with this colour, the tips of the wing-coverts are whiter, and the axillaries are more barred, nearly approaching those of the “Pin-tail” in character; but the *white interspaces* are *broadler than the dark bars*, and the reverse is the case in the last-named species. The inner web of the lateral tail-feather is darker than in the adult. There is little if any difference in the length of the bill.

Obs. Although the “pin”-feathers in the tail of the last species constitute its chief distinguishing characteristic, yet, even to the eye of a moderately close observer, the above-indicated differences (concerning which there has been some controversy in ‘Stray Feathers’) must surely be at once apparent. The present species *never* has the axillaries and under wing barred like the Pin-tail; and, further, its long and proportionately slender bill cannot fail to distinguish the Common Snipe from its Indian ally. It has been said to average lighter in weight; and, as I have stated in the preceding article, it appears to do so. The weight of a Snipe, however, depends so much on its condition that it is unsafe to rely upon it as a distinguishing feature. Mr. Parker (Str. Feath. 1874, p. 335) gives the average weight as 3 oz. 3 drms. Mr. Cripps notes the weight of eleven males from Furreedpore as 3·75 to 5·12 oz., the last-named being excessive; of the three females he records it as 3·5 to 5·0 oz. A large British series weighed by me, and for me by friends, range between 2½ and 4½ oz., the average being a little short of 4 oz.

The so-called *Sabine's Snipe*, *G. sabinii*, is an interesting variety of the present, sometimes procured in England. It was originally considered to be a distinct species. Its general appearance is brown; beneath brownish rufous, with bands of brown taking a concentric form on the lower parts; head dark uniform brown, without the mesial stripe; the buff margins on the scapulars wanting. An example from Queen's County, Ireland, in the national collection, measures—wing 5·2 inches, tarsus 1·25, bill at front 2·55.

Gallinago major is intermediate between the Pin-tail and the Common Snipe. It has sixteen tail-feathers, the four outermost on each side being white and rather stiff, though but little narrower than the rest. Its bill is stout and high at the base, like that of the Piu-tail. It may be recognized at once by the broad white tips of the primary-coverts and outer series of lesser, median, and greater wing-coverts; the *edge* of the outer web of the 1st quill is white; the cheeks are more spotted than in the foregoing two species, and the sides of the breast more barred; the barring of the under wing and the axillary plume is intermediate, the dark bands being broad, but not so close as in *stenura*; the coloration of the centre tail-feathers is almost that of the last-named species. Dimensions of a Yenesay-valley example before me are—wing 5·7 inches, tail 2·4, tarsus 1·45, middle toe 1·35, bill at front 1·4. A Petchora-river specimen likewise measures 5·7 inches in the wing.

Gallinago wilsoni, Temm., the American representative of the Common Snipe, appears to me almost undistinguishable from it. The lateral tail-feathers are slightly narrower and without so much rufous; the 1st quill is white on the outer web, as in the present, and the axillaries are the same. An example measures—wing 5·4 inches, bill at front 2·55.

Gallinago australis, Latham, is the Australian representative of the present, but chiefly resembles *G. major*. Number of tail-feathers sixteen, the four outer ones marked irregularly with white; under wing-coverts and axillary plume barred with blackish brown, like the Pin-tailed Snipe. A December example in my collection has the black of the scapulars and upper back very strongly glossed with green, the feathers with broad margins of black and rufous, and some central stripes of buff marked with black. The broad stripe over the vertex is buff. Bill greenish black near the tip, and brownish along the culmen and margin, the intermediate stripe and the base being greenish yellow; legs and feet greenish yellow. Length 12·7 inches, wing 6·7, tarsus 1·6, bill at front 3·0.

Found as far north as China and Japan.

Gallinago macrodactyla, Bonap., is the South-African representative of the Common Snipe. It has sixteen rectrices. The bill averages longer than in *G. scolopacina*; toes likewise longer. A specimen before me measures—wing 5·2 inches, tarsus 1·43, middle toe without claw 1·43, bill to gape 3·0. Axillaries openly barred; the bands black-brown; dark portions of head, back, and scapulars intensely black; three lateral tail-feathers narrow and stiff, almost entirely white, the dark markings being scanty.

Ranges as far north as Abyssinia.

There are other Snipes, five of which (*G. gigantea*, Natt., *G. paludosa*, Gm., *G. nobilis*, Schl., *G. frenata*, Bonap., and *G. paraguana*, Bonap.) are found in South America.

Distribution.—The Common Snipe was said by Dr. Kelaart to have been seen by him at Nuwara Eliya, and his statement is coupled with the remark that it is found in some of the highland districts. Layard did not meet with it, nor did Mr. Holdsworth detect it while he was in the island, although he spent much time at the Sanatorium. Kelaart's evidence cannot therefore be considered satisfactory, more particularly as he was not an accurate observer of birds. In 1873 I was enabled to publish, in the 'Proceedings' of the local branch of the Asiatic Society, an account of its first authenticated occurrence on the island. Two specimens were shot by Major Meaden, of the Ceylon Rifles, at Tamblegam, in January of that year, while I was stationed at Trincomalee; and one of these, which was obtained on the 6th of that month, is the example alluded to above. Both this gentleman and other sportsmen in the garrison informed me that they had met with it more than once at the same locality; so that I have no doubt it not unfrequently visits the north of the island in small numbers, and, finding such good quarters in that part, it is not likely to wander either into the hills or the southern half of Ceylon.

It is distributed over Europe, the northern portion of Africa, more or less over the whole of Asia (retiring chiefly to the north in the breeding-season), and extends to Formosa and the Philippines.

As regards India, we find that it arrives in the north-west in August, the 24th being Capt. Butler's earliest date of its observed occurrence in Guzerat. It is, according to him, common in the plains, and likewise occurs about Mt. Aboo. In Sindh it is abundant, Mr. Hume having met with it in all suitable localities; and he records it as plentiful in Cutch, Kattiawar, and other portions of this north-western region. In the Sambhur-Lake district it is, says Mr. Adam, rarely met with; but this is owing to the country being unsuited to it. In Bengal it is very abundant, and in the neighbourhood of Calcutta it is exceedingly numerous. In Chota Nagpur Mr. Ball notes that it occurs throughout the division, but not in abundance. In the district between the Ganges and the Godaveri he records it from Bardwan, Manblum, Sirguja, Gangpur, Sambalpur, Orissa, Nowagarh, Karial, and Jaipur. In Furrcepore it appears in October, and leaves about the end of March (*Cripps*). In the Bombay district it is not uncommon; and in Khaudala the Rev. Dr. Fairbank writes that it

is found in small numbers in all marshy places; Messrs. Davidson and Wender, speaking of the Deccan generally, say that it is commoner than the last species. In the Carnatic it is generally less plentiful than this latter, although in some seasons it has been said to occur about Madras in equal numbers with the "Pintail." In the Palanis it is only found in small numbers; and Mr. Bourdillon says it is less abundant at Trevandrum than its ally. In Upper Burmah, according to Jerdon, they arrive in small numbers as early as July; but these, I infer, are birds that have not been far north to breed. In Pegu, however, Mr. Oates affirms that the Common Snipe does not appear till December, and is then not so plentiful as *G. stenura*. In the Irrawaddy Delta Dr. Armstrong did not meet with it; and in Tenasserim it is a rare visitant to the "central portions of the province and the tract west of the Sittang river." Further south, in the Malay Peninsula, it is a rare straggler, having been recorded solely from Malacca. It is likewise the same to the Andamans, Mr. Davison having met with only one example.

It is a winter visitor to China, Hainan, and Formosa according to Swinhoe. In Formosa he met with it as early as the 22nd October; in Hainan he obtained it in February. It has been obtained in the Philippines in the island of Luzon, where Dr. Meyer met with it in the month of February.

In summer it wanders north to breed, and has been obtained on the Arctic circle by Mr. Seebohm. At Obdorsk also Dr. Finseh met with it, observing it likewise near lakes in the vicinity of Kara Bay. Schrenck met with it on the Lower Amoor in June; and it has been obtained on the Schilka in May. Middendorff procured it far up in the north-east of Siberia, finding it breeding on the Boganida, near Taimyr-land; and he obtained an example as early as the 29th of April in a mountain-brook on the western slopes of the Stanowoi Mountains. There is no reason, therefore, to doubt that it does not reach the very confines of North-eastern Siberia in its migration, and it will probably be found some day on the Anadir river. It is common throughout Japan, according to Mr. Blakiston; and Mr. Whitely likewise records it from Hakodadi. Many Snipe, however, breed in the highlands of Central Asia. We have Severtzoff's authority for it nesting throughout Turkestan; and Dr. Seully found it breeding at Yarkand, taking its eggs in June. In Persia, writes Mr. Blanford, it is common in suitable localities, and was obtained by him at 3000 feet above the sea. In Palestine it was only observed by Canon Tristram in winter, leaving the country before June. In Southern Europe and the Mediterranean islands it is common in winter; but it moves north in summer, and does not, as a rule, breed south of Central Germany, although the mountains of Transylvania are, according to Bieitz, an exception to this. Col. Irby writes that it leaves Spain entirely by the first week in April, returning again as early as the beginning of September. Mr. A. G. More, in his 'Distribution of Birds in Great Britain during the Nesting-season,' says that it breeds regularly in almost every county in England; but it is of course far more numerous in the summer in the north and in Scotland than in any of the southern counties. In Wales it likewise nests in many localities; and in Cardiganshire a considerable proportion of Snipe are resident and county-born.

Turning lastly to Africa, we find Favier, as recorded by Col. Irby, stating that this Snipe is common round Tangier from October till February. In Algeria Mr. Gurney found it common; and in Egypt and Nubia Captain Shelley states that it is generally distributed and abundant where there is suitable ground. In large marshes in Lower Egypt he has killed more than forty couple in a day. At the end of March they decrease; but some isolated examples are to be met with, says Von Heuglin, in Lower Egypt during the summer months. This author states that they are most numerous in Lower and Central Egypt in spring, and that in the winter they retire southwards to the Blue and the White Nile and to Abyssinia; in October he met with Snipe at the Dobar springs, in the Somaui territory. In Western Africa it has been obtained in Gambia; and Bolle records it as a winter visitant to the highlands of the Canary Islands. In the Azores Mr. Godman met with it in Flores, where it frequents moist places in the mountains. According to Professor Baird it is common in South Greenland; and he records likewise the capture of one example in Bermuda.

Habits.—In its economy the Common European Snipe resembles the last bird, but is, perhaps, a more persistent adherent to marshes, the edges of streams, bogs, morasses, and permanently moist places. Finseh, however, found it living in the Kara-Bay district, North-western Siberia, on dwarf-birch-covered land, which shows that it is uncertain in its likes and dislikes in the breeding-season. It is chiefly a nocturnal feeder, and is found when looked for in the spots on which it has settled down in the early morning. On being

flushed, it generally flies off uttering the well-known *sca-ā-pe* or piping cry peculiar to its genus, and almost invariably proceeds against the wind. When wild, it mounts in the air, and, if it has been walked up "down-wind," after getting out of shot turns round against wind and flies off with a tumbling flight, proceeding from side to side in its course; and well up in the air, seen against a cold grey English sky, it looks twice the size it does when rising out of the grass.

When observed in northern regions during the time of its nidification its habits are very interesting, and the life of concealment which it leads with us during the winter is changed for one of animation and excitement. Its habit of "drumming" or making a humming noise while flying over its nest has been the subject of much discussion and difference of opinion; and I will refer to the matter in the "Nidification" of the species. Messrs. Seebohm and Harvie Brown have published some interesting notes on the species as observed by them on the Petchora river, Northern Russia, which I here transcribe:—"We were not a little surprised when we first became acquainted with the arboreal habits of the Snipe at Habariki, and saw one of these birds perched, 70 feet from the ground, on the topmost upright twig of a bare larch, where, one would have thought, it could scarcely find sufficient foothold. With its head lower than its body and tail, it sat there, uttering at intervals the curious double 'clucking' note, *tjick-tjuck, tjick-tjuck*, whilst others of the same species were 'drumming' high in the air over the marsh. To put all beyond doubt, Harvie Brown shot one in this peculiar position. Nor is the Common Snipe the only bird which, not practising the habit with us, we found perching freely in Northern Russia: the Snow-Bunting and Pipits have already been instanced; and we may also mention the Common Gull, as will be seen under the notice of that species further on There can be little doubt, we imagine, that this habit was induced, in the first instance, by the flooding of great tracts of country by the annual overflow of the rivers in spring, just at the time of the passage of the migratory flights, and, further, that what was originally forced upon them has become, by use, a favourite habit."

In India the great resorts of the Common Snipe are the paddy- or rice-fields in the cultivated districts of the empire; and here very large bags are made by good shots. Jerdon speaks of 100 couples being killed to one gun in the south of India even; but among these no doubt was a large proportion of the last species. Although the popular idea obtains that Snipe only feed on "suction," *i. e.* on the liquid, impregnated with minute larvæ, which is obtained by boring in the mud with their long bills, a much greater quantity of animal matter is consumed by them than these advocates of the suction-theory imagine. Good-sized aquatic insects, particularly of the beetle order, and occasionally tolerably large worms, may be found in their stomachs; and it is pretty certain that a Snipe will never refuse to swallow any worms that it meets with.

Col. Irby, in his 'Birds of Gibraltar,' mentions that the best ground for Snipe in Morocco and Andalusia is "where sedges and rushes had been burnt during the summer;" but, there being no cover in such places, it was "useless to try and walk up to the birds, and the only way was to stand or sit perfectly still in the most favourite spot and await their return."

In Egypt their favourite haunts, according to Captain Shelley, are the large marshes in the delta of the Nile, in which he has killed more than forty couples in a day. Von Heuglin remarks that in February and March a good shot can, under favourable circumstances, kill from sixty to eighty head a day in the same district.

Very large bags were formerly made on the Irish bogs, rivalling, in fact, those of Indian sportsmen; but now-a-days, since drainage has made such alterations, Snipe-shooting is not what it used to be, and twenty couples would be considered a very good bag. I am informed that a gentleman last year killed thirty-seven couples on Sir Arthur Guinness's estate in Galway; and an account has been given to me, on good authority, of the late Mr. John Dennis, master of a celebrated pack of Galway hounds, having made a wager that he would shoot fifty couples, which feat he more than accomplished by killing forty before 11 o'clock, and finishing with a total of eighty-four couples before night. This was more than forty years ago.

Nidification.—This Snipe's eggs have not, to my knowledge, been taken in India; but there is reason to believe that it may possibly breed occasionally in Cashmir, as it does so on the other side of the range in Kashgar. Mr. W. Brooks, writing to Mr. Hume, has the following remark on its summer occurrence in Cashmir:—"I saw a Common Snipe soaring away above when I took the Mallard's nest (near one of the Cashmir lakes); and as it was making its breeding, bleating, and drumming noise, doubtless its mate was sitting on its nest below, though I failed to find it." Dr. Scully found it breeding at Yarkand in May and

June, and obtained eggs on the 12th of the latter month. In the territory of Jakoutsch, North-eastern Siberia, and in Taimyr-land, the breeding-season commences at the beginning of June, and the young are about at the end of July. Von Middendorff writes:—"On the 11th of June a female which we killed contained an egg with an already hard shell; on the 21st of June a nest with four eggs was found. On the 31st of July the young were almost fully feathered, and on the 5th of August the last example of the species seen there was shot."

The nest is placed on the ground, usually in a little depression near a tuft of grass or little earth-mound; and this is lined with dried grass, a few leaves, or sprigs of heather. The eggs vary from three to four in number, and are very variable in colour. A beautiful series of specimens in Mr. Seeböhm's collection are respectively greyish stone of various tints, olive-stone, and brownish buff in ground-colour, and vary as much in markings: some have zones of confluent colouring (sienna-red) round the large end, on which another zone of linear markings of black is scribbled; others have the large end surrounded by clouds and blotches of rich sepia of two shades, with here and there a few streaky marks, while the rest of the egg is richly marked with softened blotches of sepia. Others are rather thickly blotted all over with sepia over bluish-grey spottings, with inky-black blotches at the top; these are the palest eggs. Some, again, are clouded over the large end with sepia, and very sparingly marked at the small end with the same, with the usual hieroglyphic scribbings at the first-named part. These eggs vary in length from 1.46 to 1.64 inch, and in breadth from 1.06 to 1.13 inch. Dr. Seully describes the eggs he obtained in Kashgar as being of a dirty olive-green colour, the large end nearly covered with confused blotches of brown and brownish black, and the constricted portion marked with some largish spots of brownish. Dimensions of two specimens 1.58 by 1.11 inch and 1.58 by 1.13 inch.

I have referred above to the singular noise made by the Snipe during the breeding-season, which is variously termed "bleating," "neighing," "drumming," and which is made by the bird when, after flying round and round its nest or young, it descends with wings and tail extended, with an apparently tremulous motion of both, its whole frame being at the time in a state of rigidity or extreme tension. Some years ago Herr Meves, of Stockholm, published a paper detailing an account of some ingenious experiments which he had carried out with a view of proving that the sound was made by the bird's tail-feathers. His theory seems to have obtained general credence on the supposition, apparently, that because a man under certain conditions could succeed in making various sounds with the outer tail-feather of a Snipe, the bird itself must necessarily do the same! Herr Meves's experiment consisted in tying the outer tail-feather, which has a sickle-shaped and *rather* rigid shaft, a narrow outer and a broad inner web, to a wire $\frac{1}{16}$ inch in diameter, lashing the latter to a stick about 5 feet long (whereby he obtained a "play" or "stroke" of about 5 feet), and then moving it backwards and forwards in a horizontal position, accompanied by a tremulous movement of the arm. He thus succeeded in making a noise which he considered was astonishingly similar to that produced by the Snipe. Mr. Hancock, in his valuable catalogue of the birds of Northumberland and Durham (*loc. cit.*), was apparently the first to point out that the vibrations of the outer tail-feather as made by the Snipe cannot possibly be similar to those made by Herr Meves, and states that he made the same experiments without succeeding in producing the sound in question; and at the same time aptly remarks that a much nearer approach to it can be made "by waving backwards and forwards, with short strokes, a cane 2 or 3 feet long." The whole matter hinges upon the conditions under which the feather is moved, as also the *distance from the ear*. It is swayed backwards and forwards, in the manner he described, at a distance, or with a radius, of some 6 or 7 feet from the centre of motion; and of course a whizzing sound can be made, as the feather is stiff and very peculiarly constructed; when it is, however, vibrated by means of a movement in the caudal vertebræ of the bird, the distance of the tip of the feather is only about 4 inches from the centre of motion, and the same sound could not possibly be produced. I have tried the experiment, and have succeeded in making a sharp whizzing noise; but this by no means proves that, under the altered conditions which I have shown to exist, the bird can do the same. Mr. Hancock is of opinion that the sound is produced by the wings, which is a much more reasonable hypothesis, as most people are acquainted with the noise that the Lapwing unmistakably thus produces. Prior to reading Mr. Seeböhm's notes on the ornithology of Siberia, and conversing with that gentleman on the subject, I was inclined to agree with Mr. Hancock; but I now consider that it is much more likely it is a combined vocal and mechanical sound produced by the bird's bill. He writes (*Ibis*, 1879, p. 157), concerning the Great or Double Snipe:—"Frequently I have sat partially concealed between a couple of willow bushes

attentively turning my glass on two or three pairs of these birds, all within 15 or 20 yards of me. They used to stretch out their necks, throw back the head almost onto the back, and open and shut their beaks rapidly, uttering a curious noise, like running one's finger along the edge of a comb. This was sometimes accompanied by a short flight or by the spreading of the wings and tail." This is by far the most important evidence ever published on the subject, and tends to show that the sound can be produced through the bill, in which case it could be easily heard high up in the air.

The accompanying woodcuts show the peculiar structure of the lateral tail-feathers in the last species, and the axillary feathers of both that and a young bird of the present species: in the old bird the bars at the tips of the feathers would be almost obsolete.



Half-tail of *G. stenura*.



Axillary feathers of *G. stenura*.



Axillary feathers of *G. scolopacina*.

GALLINAGO GALLINULA.

(THE JACK SNIPE.)

Scolopax gallinula, Linn. Syst. Nat. i. p. 244 (1766); Gould, B. of Europe, iv. pl. 322 (1837).

Gallinago minima (Ray), Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 163; Middendorff, Sibir. Reise, ii. p. 224 (1853).

Gallinago gallinula (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Kelaart, Prodrumus, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Schlegel, Mus. P.-B. *Scolopaces*, p. 14 (1864); Jerdon, B. of Ind. iii. p. 676 (1864); Beavan, Ibis, 1868, p. 393; Holdsw. P. Z. S. 1872, p. 472; Shelley, B. of Egypt, p. 249 (1872); Von Heuglin, Orn. N.Ost-Afr. p. 1206 (1873); Hume, Str. Feath. 1873, p. 235; Irby, B. of Gibraltar, p. 174 (1875); Blanford, Zool. Persia, p. 283 (1876); Butler & Hume, Str. Feath. 1876, p. 15; Fairbank, *t. c.* p. 263, et 1877, p. 410; Dresser, B. of Eur. pt. 57, 58 (1877); Hume, Str. Feath. 1878 (B. of Tenass.) p. 459; Blakiston & Pryer, Ibis, 1878, p. 222; Davidson & Wender, Str. Feath. 1878, vii. p. 88; Ball, *t. c.* p. 228; Cripps, *t. c.* p. 302; Hume (List B. of Ind.), *ibid.* 1879, p. 112.

Telmatias gallinula (Linn.), Saunders, Ibis, 1871, p. 389.

Limnocyptes gallinula (Linn.), Swinhoe, P. Z. S. 1871, p. 407; Gould, B. of Gt. Britain, iv. pl. 80 (1873).

La petite Bécassine ou la Sourde, Buffon; *Jack Snipe*, Latham; *Judock, Half Snipe*, vulg. in England; *Zweig-Sumpschnepfe, Moorschnepfe*, German; *Agachadiza, Agachadera*, Spanish (Saunders). *Kanisah*, Egypt (Von Heuglin); *Saiga* (Favier), Moorish.

Adult male and female. Length 8.5 to 9.65 inches; wing 4.1 to 4.5; tail 1.7 to 2.2; tarsus 0.9 to 0.95; middle toe 0.9 to 1.05; bill to gape 1.5 to 1.6. Weight $2\frac{1}{2}$ to $2\frac{1}{2}$ oz. (Welsh examples).

The above measurements are taken from a series of European, British (Welsh, measured in the flesh), and Asiatic examples, the largest specimen of which latter is from Isfahan, Persia. The following are the dimensions of a Ceylon-killed individual (Jaffna, Jan. 1878):—wing 4.4 inches; tail 2.2; tarsus 0.94; middle toe 1.03; bill at front 1.55.

This species has only 12 tail-feathers, the centre pair of which are pointed and exceed the rest; the lateral feathers are typical of the genus, curved inwards, and with rigid shafts.

Iris dark brown; bill—culmen clear yellow, sides livid brown, base beneath greenish, tips of both mandibles black; legs and feet greyish green, brownish on the joints; claws brown.

The bill becomes much pitted on drying up after death.

Summer plumage (Heligoland). Centre of the head and nape deep black, streaked with rufous, on either side of which is a rich buff stripe leading from the nostril over the eye to the nape, in the middle of which is a narrow black streak just above the eye; face buff, through the lores a broad brown stripe, and along the cheeks, from the gape, another one leading over the ears round to the nape; hind neck fulvous brown, lightly marked with black and tipped with whitish; scapulars long and lanceolate, very widely margined on one side with rich buff and on the other with deep green, the remainder of the feather black, beautifully variegated with rich rufous and edged with metallic green; back and rump purple, edged with white; upper tail-coverts like the scapulars, but the buff not so rich and slightly tinged with green; tail brown, the centre feathers pointed and exceeding the rest, and broadly margined with rufous-buff, the lateral feathers variegated with buff; wings brown, the lesser coverts margined with whitish, the median with rufous buff; secondaries deeply tipped with whitish; outer webs of tertiaries rufous-buff, barred with black; outer web of first primary white at the base.

Chin whitish; fore neck brownish, the feathers edged with fulvous and on the sides of the chest centred with black; beneath from the chest to the under tail-coverts white, the latter with brownish-fulvous stripes; axillaries white, streaked slightly with pale brown; under wing white, the centres of the feathers pale brown.

Winter dress (Ceylon, January). Buff markings of the upper surface not so rich as in the above, and the purple and green lustre of the scapulars, tertials, and rump not so brilliant; the fulvous edgings of the tail-feathers are not so broad. This specimen, which I have compared with a series of English winter examples, is in good plumage, and is a pale type; the throat and the markings of the face and forehead are whiter than in many English specimens, and it is no doubt a fully-aged bird, as the axillaries are *pure white*.

Young nestling (coll. Dresser). Head and upper surface mingled rich rufous and black, the down tipped with white; centre of the forehead, lores, and cheeks black and rufous; a broad whitish stripe above and beneath the lores, the latter extending round the ear-coverts; chin whitish; beneath dark ferruginous brown. Bill enormous for the age of the bird, measuring at front 1.15.

Young, not quite fledged (Lapland). Plumage above much as in winter adults; but the buff lateral stripes more *rufous*, the scapulars barred with dark rufous and tipped with white; the wing-coverts broadly edged with fawn-white; fore neck (which is still in down) brownish. Bill at front 1.4 inch.

Plumage of first autumn (Wales): *female*. Colours of the back and wings not so rich as in the adult; the scapulars conspicuously tipped with white, the black bars narrower, and the rufous terminal portions mottled with black; margins of central tail-feathers dusky buff, stippled with brown; axillaries streaked with brown.

Obs. A marked difference in the *plumage* of this Snipe from that of its congeners consists in the head not having the central stripe, the tail being unbarred and the flanks wanting the transverse markings. As above remarked, the tail also differs structurally, and, in addition to this, the sternum has two emarginations, which combined characters caused Kaup to place it in a separate genus (*Lymnocryptes*). The bill, feet, and wings are those of the rest of the group, although the former is rather high at the base, and the nostril is more distant from the margin than in some. Taking these points into consideration, the Jack Snipe might not unreasonably be placed in the sub-genus *Lymnocryptes*; but I prefer not to adopt it in the present work.

Distribution.—There is reason to believe that this little Snipe is an occasional seasonal straggler to the northern parts of Ceylon. Layard heard of its occurrence in the Jaffna district during his residence at Pt. Pedro, but does not appear to have procured it himself. I give here his note concerning it:—"The late Mr. V. Burleigh, of Jaffna, an ardent sportsman and beautiful bird-stuffer, told me that he used frequently to meet with them about Wally some years ago, but that of late he had not seen any. My own testimony only reaches to a bird I saw on the table, luckily with both bill and legs perfect, and this I feel convinced in my own mind was a Jack Snipe." Mr. Holdsworth included it in his Catalogue on this "sportsman's authority;" but up to that date he had not procured any further evidence as to its occurrence. Of late years it has, I believe, been not unfrequently shot in the extreme north of Ceylon. Mr. W. Murray, of the Ceylon Civil Service, informed me that he had killed it in the peninsula; and I have heard the same from other gentlemen. In January 1877 a specimen was shot by Mr. Smart, of the Civil Service, near Jaffna, and was satisfactorily identified but not preserved; in the following January, Mr. E. F. Hopkins, Police Magistrate at Jaffna, shot another, which, through the kindness of that gentleman, is now in my possession. There is no doubt that every year some few "Jacks" find their way to Ceylon, and are overlooked among the thousands of its larger relation that visit the island.

On the mainland it is pretty generally distributed, but is nowhere numerous. In the south of India we have the Rev. Dr. Fairbank's testimony to its visiting the Palanis in small numbers, and it was observed by him frequenting the vicinity of the Lake at Kodaikanal, which has an elevation of 7000 feet. In the Deccan it is said to be common, but less abundant than the European Snipe; and the above-mentioned gentleman observes that it frequents all marshy places in the Khandala district, occurring, however, only in small numbers. In the north-west it is recorded as common in Sindh in the cold season (*Hume*), rare about the Sambhur Lake, which is an unfavourable locality for all Snipe (*Adam*); common on the plains of Guzerat (*Butler*), and, according to Mr. Hume, it is likewise so throughout the surrounding region; but Major Hayes-Lloyd does

not record it from Kattiawar. Its earliest date of arrival in this region, as noticed by Capt. Butler, is the 23rd of September; in Sindh, Major Le Messurier speaks of individuals being procured on the 3rd October. In parts of Bengal it is common, occurring locally and uncertainly as regards consecutive seasons. Mr. Hume notes that a *few* are daily brought into the Calcutta bird-market during the time of their visit. In Furreedpore a few couples are met with (*Cripps*); and at Barrackpore Captain Beavan noticed it about the middle of November. He remarks that it occurs frequently in some years and rarely in others. "I have seen it," he says, "in most abundance in a jheel at Berhampore, near Moorshedabad; but the species seems most erratic in its wanderings, and takes to certain spots, where one is sure to come across them year after year, while it entirely avoids just as likely-looking ground within a short distance." In the Bardwan district it has been procured by Mr. Brooks at Assensole. Eastward of the bay it becomes rarer. In Pegu it is now and then met with, says Mr. Oates, being far from common; to the more southern region of Tenasserim it is a straggler; but beyond this, in the peninsula, we have no record of its occurrence, and, unlike the two preceding species, it does not cross the water to the Andamans. Mr. Hume, writing of Tenasserim, says, "Captain Dodd, the Master-Attendant at Moulmein, has, on several occasions, shot Jack Snipe in the neighbourhood of that place. We have not ourselves seen specimens; but there is no doubt about this matter. Captain Bingham also shot one last season" (1877). From the data, therefore, to hand up to the present time we see that the Jaffna peninsula in Ceylon (lat. $9^{\circ} 30'$ to $9^{\circ} 40'$) is the most southerly Asiatic point of its migration; and this is about the same parallel which it reaches in North-eastern Africa.

On the eastern confines of Asia it is not at all common. Swinhoe does not record it from China, but only mentions it having been once obtained in Formosa. It was likewise not seen by Père David, who only quotes Swinhoe for its occurrence in Formosa.

Messrs. Blakiston and Pryer do not include this bird in their Japan list; but Mr. Whitely obtained a specimen at Hakodadi. From Central and Northern Asia we have but little information concerning its habitat. Dr. Scully did not observe it at Yarkand; it is likewise absent from Dr. Henderson's list ('Lahore to Yarkand'); but, on the other hand, in portions of Turkestan M. Severtzoff records it as occurring on passage, but not found above 4000 feet.

Its breeding-home, as far as Asia is concerned, is Northern Siberia; but it has not been observed by all naturalists who have visited that region. I find that Von Middendorff records it as breeding on the Boganida, in 70° N. lat., and he observed it there from the 8th of June until the 31st of August; but there is no mention made of it on the Ob by Dr. Finsch, nor on the Yenesei by Mr. Seeböhm. In Palestine Canon Tristram met with it; and in Persia Mr. Blanford says it is common in suitable localities during the winter months.

On the continent of Europe it is a more plentiful bird, inhabiting the southern portions in winter, and breeding, according to Von Heuglin, from Central Germany northward to Scandinavia. It inhabits the Mediterranean islands, for in Corsica Mr. B. Wharton met with it; and in Sardinia it is, according to Mr. A. B. Brooke, common. It appears to be plentiful in Holland, which is a great Snipe-country; and it occurs in Heligoland on passage. To the British Isles it is a winter visitant; it has now and then been seen during the summer months; but its nest has never been found within our limits. Mr. Hancock has seen it at Prestwick Carr in Northumberland at a time when Redshanks were nesting. In the south of Spain it is common; and near Seville Col. Irby records it as very numerous in certain localities. It appears to be distributed along the northern shores of Africa in a similar manner to the last species. Favier, as quoted by Col. Irby, states that it arrives in the Tangier district in November and leaves in February; and Mr. Gurney and Canon Tristram record it from Algiers. In Lower Egypt, Captain Shelley remarks that it is common, frequenting, like the last, the Fayoom and the lake at Erment; it was observed by him at Dendera as late as the 24th March. Von Heuglin has noticed it still later, namely, in the month of May, and is of opinion that it may perhaps breed in the Nile delta, as he obtained males in the spring with the organs developed. It was observed on the Blue Nile by Brehm and Vierthaler; and this is its most southerly African limit.

Habits.—This beautiful species, the smallest of its family, frequents marshy ground which is overgrown with thick grass, the boggy banks of small streams, sedgy morasses, and wet moors, where the turf is spongy; and in India is found with other Snipe in rice-fields, by the sides of jheels, and such-like places. It is noted

for its habit of lying close, being difficult to flush, taking short flights, and suddenly dropping again; when fired at and missed repeatedly, as I have seen happen, it refuses to leave the locality which it has selected, darting away each time with its extraordinary zigzag flight, circling round, and then twisting sideways, suddenly disappears in the grass. This irregularity in its flight makes it very difficult to hit. The speed with which it flies is not equal to that of its relations, but it is more than compensated for by the erratic course which it takes. It is not a sociable bird, as a rule, not more than two or three being found in the same locality, which are flushed at some little distance from one another; and it often occurs that it is the solitary occupant of some little morass. Col. Irby, however, observes that in Southern Spain (where its favourite haunts were the "ojos," or land-springs, at the edges of the marisma) it collected in little assemblies before migrating. He thus writes of it:—"Towards the end of February, Jack Snipes assemble together very much; and this gathering of them is a sure prelude to the general departure of most of the Snipes for the north. The greatest number of the present species that I ever saw anywhere was in some of the 'ojos' westward of Coria del Rio, near Seville; these circular spots, about 10 yards in diameter, are very muddy and sparingly covered with short sedge. Many of them held fifteen or a dozen Jack Snipe; and the often-cited but imaginary individual who is said to have found a single Jack Snipe afford him sport for months, until his friend unluckily killed it, would indeed, have been in happy hunting-grounds." In extensive swamps of the Delta of the Nile, Von Heuglin found it singly or in more or less scattered companies, frequenting places which were thickly overgrown with rushes, in both fresh and brackish water; and he remarks that in that locality it preferred the vicinity of the sea to affecting the sides of streams. In very hard weather it lies very close, even though it be feeding in a comparatively open spot, such as in running water at the edge of a stream, from which I have flushed it, and noticed it fly off rather heavily, with an even flight. Its diet sometimes consists of minute shellfish. I recently found the stomach of a specimen I skinned crammed with tiny bivalves, measuring one eighth of an inch in diameter, and which apparently belonged to the genus *Sphaerium*.

Nidification.—In Europe the Jack Snipe breeds during the month of June, resorting to the great swamps in Lapland to nest. In 1853, Mr. Wolley, the celebrated oologist, found several nests in the great marsh of Muonioniska; he describes them as being "made loosely of little pieces of grass and *Equisetum* not at all woven together, with a few old leaves of the dwarf birch, placed in a dry sedgy or grassy spot close to more open swamps." The female sits so closely that it will almost suffer itself to be caught. Mr. Wolley writes with reference to the nests which he found:—"In the course of the day and night I found three more nests, and examined the birds of each. One allowed me to touch it with my hand before it rose; and another only got up when my foot was within 6 inches of it." The eggs are enormously large in proportion to the size of the bird, four of them being said to weigh $1\frac{1}{2}$ oz. I am indebted to Mr. Dresser for an opportunity of examining a small series of five which were collected in Lapland. They are stone-buff, with an olivaceous tinge on two, and are pyriform in shape, some more pointed than others at the small end; they are handsomely marked with large blotches and clouds of deep sepia, collected in some specimens in the form of a cap, and in others in a zone round the large end, besides which there are other tolerably large blots on the smaller half; under these lie blotches of bluish grey, which in one egg are very large and dark and take a transverse direction; at the larger end there are some fine dark peneillings in one or two examples. In size they vary in length from 1.47 to 1.55, and in breadth from 1.06 to 1.11.

During the breeding-season, the Jack Snipe makes a peculiar noise on the wing, which is considered to be akin to that made by the Common Snipe. Mr. Wolley, who discovered this habit, writes to Mr. Hewiston as follows concerning it:—"It was on the 17th of June 1853, in the great marsh of Muonioniska, that I first heard the Jack-Snipe, though at the time I could not at all guess what it was,—an extraordinary sound, unlike any thing I had heard before; I could not tell from what direction it came; and it filled me with a curious surprise. My Finnish interpreter thought it was a Capereally, and at that time I could not contradict him; but soon I found that it was a small bird gliding at a wild pace at a great height over the marsh. I know not how better to describe the noise than by likening it to the cantering of a horse in the distance, over a hard, hollow road; it came in fours with a similar cadence, and a like clear yet hollow sound. It was not long after I heard it that I ascertained that the remarkable hammering noise in the air was made by the Jack-Snipe."

Genus LIMOSA.

Bill very long, slightly recurved, the tip slender and flattened, the base high, and the culmen rounded there; nostrils linear, placed close to the margin, and slightly advanced from the gape; both mandibles grooved at the sides from the base to the tip. Wings long, the 1st quill the longest. Tail short and even. Legs long, the tibia bare much above the knee. Tarsus covered in front with transverse scales. Toes moderate, the hind toe well developed; outer and middle toe connected at the base by a web; middle claw dilated, *recurved*, and pectinated on its inner edge.

Summer plumage differing from that of winter.

LIMOSA ÆGOCEPHALA.

(THE BLACK-TAILED GODWIT.)

Scolopax ægocephala, Linn. Syst. Nat. i. p. 246 (1766).

Scolopax limosa, Gm. Syst. Nat. i. p. 666 (1788).

Limosa melanura, Leisler, Nachtr. Bechst. ii. pp. 150, 157 (1811-15); Gould, B. of Eur. iv. pl. 305 (1837); id. B. of Gt. Brit. iv. pl. 50 (1873).

Limosa ægocephala (L.), Blyth, Cat. B. Mus. A. S. B. p. 268 (1849); Von Middendorff, Sibir. Reise, ii. p. 218 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 681 (1864); Holdsw. P. Z. S. 1872, p. 473; Shelley, B. of Egypt, p. 245 (1872); Sharpe & Dresser, B. of Eur. pt. 15 (1872); Hume, Str. Feath. 1873, p. 235; Von Heuglin, Orn. N. Ost-Afr. ii. p. 1153 (1874); Irby, B. of Gibraltar, p. 169 (1875); Oates, Str. Feath. 1875, p. 346; Butler & Hume, *ibid.* 1876, p. 16; Seebohm & Harvie Brown, Ibis, 1876, p. 202; Blanford, Zool. Persia, p. 283 (1876); Ramsay, Ibis, 1877, p. 469; Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; Cripps, *ibid.* vii. p. 302; Hume, *t. c.* p. 486; id. *ibid.* 1879 (List of Ind. B.), p. 112.

La grande Barge rousse, Buffon, Pl. Enl. 916; *Jadreka Snipe*; *Red Godwit*, Lath.; *Small Godwit* of some. *Gairiya* also *Burra Chaha*, Hind.; *Jaurali*, Bengal.; *Tondu ulanka*, Telegu (Jerdon); *Tchibib*, Moorish (Favier); *Abujeta*, Andalucia (Irby); *El aqât*, *Biqâ* or *Biqâ el Sultani*, Arabic (Von Heuglin).

Adult female (Sambhur). "Length 15·8 inches" (*Adam*); wing (imperfect) 8·2?; tail 3·5; tarsus 3·0; bare tibia 2·0; middle toe 1·45, its claw 0·4; bill at front 4·0.

Adult male (Asia Minor). Wing 8·4 inches; tail 3·0; bare tibia 1·8; tarsus 3·1; middle toe with claw 1·8; bill at front 4·1.

Obs. This species varies very much in size. Females as a rule are larger than males. A series of Furreedpore examples measured by Mr. Cripps range, in the wing from 7·5 to 7·92 inches, in the tarsus from 2·75 to 3·08, in the bill, at front, from 3·6 to 4·39, and in weight from 8·6 to 12·12 oz. Except in the latter point, the margin of difference is not so great here; but elsewhere, in 'The Ibis,' 1873, Messrs. Alston and Harvie Brown notice a specimen in the Archangel Museum with the wing 9·0 inches, tarsus 3·8, bill to gape 4·87.

Iris dark brown; bill fleshy red, darkening to brown at the tip, the culmen brownish; legs and feet blackish.

Winter plumage (Sambhur). Head, hind neck, interscapulars, scapulars, tertials, and median wing-coverts pale earthy

brown, lightest on the head and hind neck, and darkening on the lower back into dark brown, the edges of the feathers throughout paler than the rest; lesser wing-coverts, primaries and their coverts, terminal portion of the secondaries and greater coverts blackish brown, the two latter and the primary-coverts darker than the primaries; rest of the secondaries, terminal portion of the greater coverts, tips of the primary-coverts, and more than the basal half of the primaries, together with the upper tail-coverts and basal half and tip of the tail, pure white; remainder of the tail black, decreasing towards the lateral feather, which is all white except about half an inch; extreme tips of the primaries white; a whitish stripe from the bill over the eye, a narrow dark orbital fringe; lores dark brown; chin, face, and throat whitish; fore neck pervaded with greyish, the bases of the feathers dark brown; under surface, axillaries, and under wing white, sullied on the upper breast with greyish; feathers beneath the ulna dark brown.

Summer plumage, male (coll. Dresser). Head, entire neck, and sides of chest rufous, the feathers of the head with broad central black-brown stripes, diminishing on the hind neck and increasing again on the lower part, and expanding into broad central bars on the upper back and scapulars, the latter of which parts are likewise barred with rufous; tertials barred with black and rufous; face finely streaked with brown; the chest and flanks barred with black; the rufous colour on the flanks only present as an edging to the black bands; a few black bars on the under tail-coverts and abdomen; lower back and terminal half of the upper tail-coverts black; tail as in winter.

Female. "Differs from the male in having the colours on the head and neck much duller; the back is devoid of the rich ferruginous and black markings, and is dull earthy grey, marked here and there with black and rufous, the scapulars and innermost secondaries are only to a small extent marked with black and ferruginous, as in the male; the feathers on the breast are duller in colour, and have the black bars only very irregularly defined; and the rest of the underparts are much whiter and less barred than in the male." (*Dresser*.)

Young, nestling in down. "Rusty yellow, marked with black, especially on the crown and rump; a narrow streak through the eye, wing-joints, cheeks, and belly light yellow." (*Id. fide Meves*).

Immature. Young birds differ from the adult in winter in having the scapulars and tertials edged and indented with rufous-buff, the wing-coverts margined and edged with white, and the head-feathers edged with buff; back blackish brown.

Obs. The Bar-tailed Godwit, *L. lapponica*, which is found in North India, may possibly wander as far south as Ceylon. It has the tail greyish white, in winter barred with brown; rump pure white as a rule, though specimens are sometimes found with this part marked with brown. The axillaries are barred with blackish grey instead of being pure white.

Limosa brevipes, Gray, the Australian Black-tailed Godwit, is a small race of the present species. An Amoy specimen before me measures in the wing 7.3 inches, bill at front 3.1. It is in summer plumage, and differs somewhat from *L. ægocephala*; the chin is white, and the breast pale rufous barred with blackish, the bands being continued down upon the flanks, and the ground-colour of the lower parts is brownish grey.

Other species are:—*L. novæ-zealandiæ*, the Chinese and Australian representative of *L. lapponica*, differs in having the rump and upper tail-coverts barred with brown; *Limosa fedoa*, Linu., and *L. hudsonica* are American species.

It will be well to notice here, curiously, the remarkable form *Pseudoscolopax semipalmatus*, the Suipe-billed Godwit, which forms a link between the Snipes and the genus under consideration. This rare and interesting bird, which Mr. Hume suggests may be a vanishing species (but which I hope may not be the case), was procured once (the type) by Jerdon at Madras, so that it may some day wander as far south as Ceylon. The bill is that of a Suipe. The feet are partially webbed, and the legs are longer than those of a Suipe, while the plumage is like that of a Godwit. Mr. Hume has recently obtained three specimens in the Calcutta market, of which he records the dimensions as follows:—Length 13.0 to 13.3 inches; wing 6.75 to 7.1; tarsus 2.0 to 2.2; tail 2.4 to 2.6; middle toe and claw 1.48 to 1.58; bill from gape 2.89 to 3.1; weight 3.9 to 4.1 oz.

The above-mentioned group of birds, combined with the next species, the Avocet Sandpiper (*Terekia cinerea*), form the subfamily Limosinæ of some authors.

Distribution.—The Black-tailed Godwit may perhaps be a not unfrequent cool-season straggler to Ceylon. I have never met with it, nor have I seen any examples which have been procured in the island since

Layard's time. This naturalist records the shooting of a pair at Point Pedro in April; and these specimens are now extant in the Poole collection. It should be looked for in future by gentlemen collecting on the shores of the Jaffna peninsula. It is a common bird in India during the cool season, but is, on the whole, more confined to the north than the south, and, like some other "Waders," I imagine it is more numerous in some seasons than others. It is to be found in the maritime regions at the mouths of rivers and on the muddy flats surrounding salt lagoons and backwaters. In the Calcutta district it is common at the beginning and end of the cool season, but in the interior very few are seen. In Furreedpore Mr. Cripps noticed numbers at a sheet of water in some large paddy-fields in March; but by the beginning of April "not a bird was to be seen." In Pegu it was not noticed by Mr. Oates; but he writes that numerous flocks frequent the mud flats at the mouth of the Sittang. Further south in Tenasserim the limit of its range, as yet ascertained, is Moulmein, whence Mr. Hume records a single specimen. It was only once seen in Burmah, at Tonghoo (?), by Capt. Wardlaw Ramsay, and is therefore a very local bird on the east side of the Bay. As regards the north-west, Capt. Butler states that it is common in marshy land and about tanks near Deesa; and at the Sambhur Lake it is to be found in large flocks. In Kattiawar it is reported to be common in the winter. Elsewhere on the banks of the Indus and on the larger rivers of the Punjab it was occasionally observed by Mr. Hume; and in the swamps and broads of Sindh it was seen by him in large flocks. Individuals which, as in the case of other Waders, are barren and non-migratory birds have been noticed at Kurrachee during the breeding-season. In Persia Mr. Blanford obtained it at the mouth of the Euphrates, and says that it is found on the Caspian. In Turkestan Severtzoff says that it occurs on passage in the north-western district, which extends up to the sea of Aral, and breeds on the salt plains and other lands up to 1000 feet in elevation. Mr. Dresser remarks that "Dr. Radde observed large flocks in Siberia, at Tarei-nor, on the 12th of May, 1856, but lost sight of them during the summer. At Altansk, on the 30th of July, large flocks of old and young birds had collected preparatory to leaving." Von Middendorff found a Godwit breeding on the Selantar Island, in the sea of Okhotsk; but it is not quite clear whether it was this species or the smaller *L. brevipes*, which inhabits China, the Malay archipelago, and Australia. Przevalsky records this latter species only, under the title of *L. melanuroides*, from South-east Mongolia, and so do Messrs. David and Swinhoe from China; it therefore appears that the present bird does not range to the eastern coasts of Asia.

Turning to Europe we find this Godwit extending in summer as far north as the White Sea, where it doubtless breeds. In Greece and the Ionian Islands it occurs in winter; but elsewhere, in Sicily, Sardinia, and in Italy, it is a bird of passage in spring and autumn. It breeds commonly in Holland, also in Denmark, Silesia, and in Scandinavia. Until of late years it used to nest in Norfolk and Cambridgeshire, and also in Lincolnshire; but it has now become a mere visitant, and is often obtained in spring and autumn. It is a winter visitant to Scotland, but does not occur in Ireland. According to Sabaniëff it breeds on the western slopes of the Ural as high as $58\frac{1}{2}^{\circ}$ N. lat.; it is common in the valleys of South-eastern Perm, and probably breeds, he says, in the Kamishlovsky district. Although it is, as stated, a bird of passage in the Mediterranean region, it is said, on the authority of Von Homeyer, to breed on the Balearic Isles. In Spain, writes Mr. Saunders, it is not uncommon in winter and abundant in March on passage; and in Andalucia Col. Irby says that it appears in February in bands of from four or five to two or three hundred in number, frequenting the grassy marshes or inundated ground about Casa Vieja and the marismas; its numbers vary considerably in different years, but by the end of March their passage is nearly over, and at that time they are "well advanced in their rufous breeding-plumage." Immense quantities are brought into the Seville market in March; and this author likewise states that some few birds are found in the winter in Andalucia. It is stated to be common in Portugal. In Morocco Favier records, in his MS. notes, that "it is found on passage near Tangier in abundant flocks, migrating to the north during the months of February and March; they are observed returning in August and September." As regards Egypt, Captain Shelley writes that it is "a winter visitant, ranging throughout Egypt and Nubia, and is by no means uncommon in Lower Egypt and the Fayoom, where I frequently shot it." Von Heuglin states that while many remain in Central Egypt and in the Nile delta after their arrival in September, others ascend the Nile and its tributaries as far as the Kordofan swamps and the Blue and White Nile to about latitude 12° . He saw numbers at the Tana Lake in Abyssinia, and met with solitary individuals until the middle of May, so that he thinks it not impossible that many Godwits may pass the summer there. I do not find it recorded from the west coast of Africa; but it has been obtained in

the Canaries and, according to Von Heuglin, in Madeira. It has also been obtained in the Faroe Islands, is said to be common in Iceland, and has on one single occasion been procured in Greenland, from which remote region it was recorded by Professor Baird in 'The Ibis,' 1867, p. 282.

Habits.—The Small Godwit, like its congeners, inhabits by choice the vicinity of the sea-shore, frequenting sand banks, mud flats, and tidal estuaries; but it is often found on freshwater marshes, flooded lands, the borders of large rivers, margins of lakes, and other such favourite localities as Waders usually resort to. It assembles in flocks more than most large shore birds, and moves about a good deal, not remaining many days in the same locality. Col. Irby states that they are very restless, shy, and difficult to get within shot of, and that the best way of obtaining them is to lie up for them or ride a stalking-horse. By this expedient I have known many birds, more especially Bustards, to be shot when no other plan succeeded. Captain Shelley, who often saw it alone, says that it feeds in company with Redshanks, Ruffs, and other Waders, but when on the wing keeps separate from them. At times it associates with small Waders, such as Stints. When not feeding it stands erect, with the neck drawn back and the bill horizontal, and thus assumes the position of an Egret. Messrs. Seebohm and Harvie Brown particularly remark upon this attitude in their paper on the birds of the Petchora River. In the breeding-season it is very noisy; and Pallas likens its note at that time to the neighing of a foal. Its flesh is said to be excellent eating.

Nidification.—Nothing is recorded of the nesting of this Godwit in Asia; but in Europe its breeding-habits are well known. Dr. Taczanowski, of Warsaw, writes an interesting account of the species as observed on the Vistula to Mr. Dresser, from whose work I transcribe the following passage:—"Usually they begin breeding early in May, and about the middle of June young may be found fully fledged. They generally breed in large societies, in tolerably damp places covered with high thin herbage where there are tussocks or small dry places, but also in the fields (in scattered pairs or small colonies) and in small marshes covered with grass and bushes. On the top of a tussock or a dry place they make a depression about 3 inches deep, and line it carefully and neatly with dry grass, depositing four eggs, which both male and female sit on. If a human being approach their nesting-colony, they meet him when some distance from it, uttering loud cries, and returning again and again in larger numbers as he comes nearer to their nests. When he is amongst the nests all the birds fly overhead uttering a continued lamentation. If the intruder remains there any time, they become tamer, and a few return to their eggs, especially if the latter are hard-set. Before they have eggs they are very shy, rarely approaching within gunshot; but when the young are hatched they are most courageous, and will come within a few feet of the intruder, not even retreating when fired at, and dozens may be killed. They will attack a cow or horse if they approach their breeding-places, and attack and pursue any bird of prey or Crow that may pass near. When the young have attained a good size the parents take them to some other place, generally to the fields or shores of the lakes, where they assemble from all parts, and leave when old enough to do so."

From an examination of a series in Mr. Dresser's collection, many of them purchased in Leadenhall Market and procured in Holland, I find that the eggs of the Black-tailed Godwit are unlike those of most species of this family. They are of a pure olive tint, some browner than others, and are rather scantily marked with dusky brownish and olive-brown, in some eggs in the form of clouds, and in others of blotches and spots, very light in some, and more pronounced in others; dusky grey, lightly indicated clouds underlie the upper markings. They are pyriform in shape and broad at the large end. They measure 2.14 by 1.54 inch, 2.24 by 1.53, and 1.94 by 1.48.

Genus TEREKIA.

Bill long, slender, recurved, somewhat widened at the base; both mandibles grooved, as in *Limosa*; the tip flattened and bent down; nostrils as in the last genus. Wings long, reaching to the end of the tail, the 1st quill the longest. Tail of 12 feathers, short, cuneate. Legs rather short; tarsus longer than the middle toe and claw, covered in front with narrow transverse scales; anterior toes joined at the base by a web, most developed between the outer and middle one, and which extends along the sides in a narrow membrane; claws short and wide.

Summer plumage differing slightly from the winter.

TEREKIA CINEREA.

(THE TEREK SANDPIPER.)

Scolopax cinerea, Gld. N. Comm. Acad. Sci. Imp. Petrop. xix. p. 473, tab. xix. (1774).

Scolopax terek, Lath. Ind. Orn. ii. p. 724 (1790).

Totanus javanicus, Horsf. Trans. Linn. Soc. xiii. p. 193 (1822, descr. orig.).

Scolopax sumatrana, Raffles, Trans. Linn. Soc. xiii. p. 327 (1822).

Numenius cinereus, Bonn. et Vieill. Enc. Mth. iii. p. 1157 (1823, descr. orig.).

Limosa cinerea (Gld.), Von Middendorff, Sibir. Reise, ii. p. 216 (1853); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1157 (1874).

Limosa terek (Lath.), Gould, B. of Eur. iv. pl. 307 (1857).

Terekia cinerea (Gld.), Gray, Gen. B. p. 88 (1846); Gould, B. of Austral. vi. pl. 34 (1848); Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Jerdon, B. of Ind. iii. p. 682 (1864); Gould, Handb. B. of Austral. ii. p. 261 (1865); Blanford, Zool. Abyssin. p. 433 (1870); Swinhoe, P. Z. S. 1871, p. 406; Layard, B. of S. Afr. no. 609 (1867); Sharpe & Dresser, B. Eur. pt. 4 (1871); Holdsw. P. Z. S. 1872, p. 474 (first record from Ceylon); Hume, Str. Feath. 1873, p. 237; id. ibid. 1874, p. 296; Salvadori, Ucc. di Borneo, p. 330 (1874); Butler & Hume, Str. Feath. 1876, p. 16; Ball, *t. c.* p. 236; Armstrong, *t. c.* p. 341; Blanford, Zool. Persia, p. 283 (1876); Selater & Taylor, Ibis, 1876, p. 64; Seebohm & Harvie Brown, *t. c.* p. 292; Butler, Str. Feath. 1877, p. 223; Hume, ibid. 1878 (B. of Tenass.), p. 460; id. ibid. vii. p. 480; id. 1879 (List B. Malay Penin.), p. 70, et p. 112 (List B. of Ind.); Seebohm, Ibis, 1879, p. 152.

Xenus cinereus, Gld., Alston & Harvie Brown, Ibis, 1873, p. 68.

Terek Avoset, Penn. Arctic Zool.; *Terek Snipe*, Lath.; *Terek Godwit*, Gould; *Avocet Sandpiper* of some authors; *Terek-Sehnepfe*, German; *Kulek*, Russian. *Kaukale*, Amurland (Sehrenek); *Kooning kaki*, Sumatra; *Bedaran*, Choweyan, Java (Horsf.).

Adult females (December to Feb., Kurrachee). Wing 5.1 to 5.18 inches; tail 2.3 to 2.4; tarsus 1.08 to 1.1; middle toe 0.85 to 0.87; bill at front 1.85 to 1.95, to gape 1.98 to 2.01.

The above measurements are from specimens in my own collection. A *male* recorded from Sambalpur by Mr. Ball is measured by him as follows:—wing 4.9 inches; tail 2.2; tarsus 1.1; bill at front 2.2. Mr. Hume notes the dimensions of a series of females from Kurrachee and the Mekran coast as:—length 10.0 to 10.5 inches; wing 5.1

to 5.2, expanse 17.0 to 17.25; tail 2.0 to 2.5; tarsus 1.1 to 1.15; bill at front 1.75 to 2.0. The bill varies much in length; Schrenck gives that of an Amoor-river example at 1.54 (1 inch $6\frac{1}{2}$ lines). Iris brown; bill blackish brown, orange-yellow at base; legs and feet orange-yellow.

Winter plumage (December, Kurrachee). Head, hind neck, back, scapulars, tertials, inner median and greater coverts, and tail grey-brown, the feathers with dark shaft-lines, and the shorter scapulars blackish brown at the centre, blending into the surrounding paler colour; margins of the upper tail-coverts and rump-feathers whitish, with an inner border of darker brown than the rest of the feather; lesser, outer median and greater, and the primary-coverts dark brown; primaries the same, the first shaft and the inner edges of the feathers white; secondaries dark brown, with most of the inner webs and the tips white, this colour including the terminal half inch of the outer webs; tips of the inner primaries white; the three lateral tail-feathers with white inner and outer margins, occupying most of the outer web of the lateral one; forehead, eye-stripe, and front of face whitish; lores brownish; ear-coverts striped with brown, with a whitish patch just above; throat and under surface white; fore neck, except just down the centre, with narrow brownish shaft-lines; under wing and axillaries white, the bases of the feathers along the edge brown.

A February specimen has the shorter scapulars with more brown, and it is continued in rather narrow shaft-stripes to the longer feathers.

Summer plumage. Asiatic and European birds both show the same insignificant change in the plumage during the breeding-season; and examples in Mr. Dresser's collection correspond with Chinese specimens. A Shanghai example in the Swinhoe collection (3rd May) differs but little from the above winter specimens; the plumage is slightly darker, and the shaft-stripes on the interscapular region are bolder, and the dark spear-shaped centres of the shorter scapulars are blacker and extend in moderately broad stripes to the longer feathers; dark brown feathers are appearing on the interscapular region; the upper tail-coverts are pencilled and indented with dark brown, and the fore neck and chest have narrow mesial brown stripes on the feathers. This is the commencement of the summer plumage, which seems to be acquired by a change in the colour of the feathers, combined with a partial moult, as is the case with the rest of the family.

Mr. Ball remarks, with regard to the above-mentioned specimen (May), that it shows no approach to the summer plumage; but Mr. Swinhoe instances an example (16th April) killed at Shanghai which is in summer plumage; it is probable, however, that this bird is no further advanced than the one just described.

Young nestling, in down (coll. Dresser). Buff-grey above, mottled and marked with black, principally down the back; a bold stripe through the lores, continued behind the eye; sides of the rump marked with black; a stripe over the crown. There are no very characteristic markings in this nestling. Bill at front 0.4 inch.

Distribution.—This curious Sandpiper is a comparatively recent addition to the avifauna of Ceylon, as it had not been noticed in the island prior to Mr. Holdsworth's meeting with it. He chronicles his discovery as follows:—"I obtained one specimen in winter plumage, out of a flock of five, in April 1869; they were in a small swamp near the sea at Aripu." It is perhaps a frequent *straggler* to Ceylon in the cool weather, arriving and departing unnoticed, as small Waders are but little shot in the north.

It is a bird of singular distribution, being scattered more or less over Asia, extending to Australia; Eastern Europe and Eastern Africa are taken into its range, but it avoids the western side of both continents. It is not generally diffused throughout India, being for the most part a shore-bird. Jerdon writes as follows concerning it:—"This neat-plumaged little Sandpiper is not very abundant in the south of India, but is met with more frequently towards the north." Mr. Ball records but one specimen from the coast of the Orissa Province; and Mr. Hume has only once met with it in the Calcutta market, when an entire flock of fifty had been netted. From Burmah it is not recorded; and in Tenasserim it is found rarely along the coast and creeks of the central portion of the province. Mr. Davison obtained it at Amherst, Thatone, and Tavoy; and he likewise met with it commonly about Port Blair, in the Andamans, but did not see it in the Nicobar group. In the north-west of India it is a common bird on the sea-coast in some parts. In Kurrachee harbour and on the Mekran coast Mr. Hume found it abundant. Turning eastward again, in which direction it has a wide range towards the south, we find it recorded from Kopah, in the Malay Peninsula, as also from Java and Sumatra, in the former of which several naturalists, including Horsfield, procured it, and in the latter Raffles observed it, and, taking it for a new species, described it under the name of *Scolopax sumatrana*. In Borneo it has been obtained in Sarawak.

Bernstein procured it in the islands of Morotai and Halmahera. It wanders south to Australia, where Mr. Ramsay records it from the Wide-Bay district and from New South Wales; but, as in the case of *Totanus glottis*, it is omitted in his "Distribution" list from Tasmania, where it was procured by Mons. Labillardière (*Sharpe & Dresser*). Gould obtained a specimen on the river Mokai, in New South Wales, on the 12th of July, 1839. Its migration to Australia and the Malay Archipelago must take place from North-eastern Siberia by way of China, where Swinhoe records it only from Tientsin and Shanghai; he does not seem to have met with it as often as might have been expected, and its scarcity there shows that it is not a very abundant species; but it is a great straggler during the winter season. The same is observable on the western confines of its habitat, as it is far from being abundant down the eastern side of Africa. It has been obtained in Japan by Siebold. Von Middendorff met with large flocks, some of them containing fifty individuals, at the end of June, on the south coast of Okhotsk; but they were not about to breed and were in winter plumage. This seems to have been an assembly of first-year birds, to which we have a parallel in Mr. Hume's account of a flock of fifty being netted at Calcutta at once. Schrenck procured it on the Amoor river; and Mr. Seebohm reports it as common on the Yenisey as far north as lat. 70° in the breeding-season; and Dr. Finsch met with it in North-west Siberia, near Kara Bay, on the 20th of July. In Western Asia it does not appear to be widely distributed. Severtzoff does not record it from Turkestan, it being almost the only member of the Asiatic Scolopacidae which he does not notice; and Mr. Blanford only includes it in his list of Persian birds as having occurred in one locality—Enzeli, on the Caspian, where Filippi met with it. It was not until the summer of 1875 that it was heard of in Turkey, where a pair were shot near the Sweet Waters by a Mr. Pearson; and it was unknown in Italy until three were shot in the neighbourhood of Pisa in May 1869, and the occurrence published shortly afterwards by Salvadori. Messrs. Sharpe and Dresser state that though it breeds plentifully in Northern Russia, it seldom visits any other part of Europe.

Messrs. Alston and Harvie Brown found it abundant in the delta of the Dwina and on islands near Archangel; and Mr. Seebohm and the latter gentleman met with it, but not in such numbers, on the Petchora.

It has seldom occurred in Sweden, and is unknown in Great Britain and Spain, though it has been procured in France. Down the eastern side of Africa it is a mere straggler. Neither Shelley or Von Heuglin record it; but Mr. Blanford met with an example on the coast of the Gulf of Adulis, and it has been shot on the Arabian coast of the Red Sea. In the south it was obtained in Madagascar by Pollen, which is a great proof of its wandering nature. Layard does not seem to have met with it in Cape Colony, and merely instances a specimen having been shot in Natal by Mr. Ayres.

Habit.—The exact position of the Avocet Sandpiper among the Scolopacidae has been a matter of dispute. Its curved bill has caused some to place it in the genus *Limosa* as a Godwit; while others, looking at its short legs, its note, and general habits, and the character of its eggs, maintain that it is more nearly allied to the Totanine section of the Sandpipers; and this would seem to me to be its proper location. It is, in fact, a slightly aberrant member of the *Totanus* group, and constitutes a link between it and the Godwits. It frequents the shores of bays, the mouths of rivers, the edges of salt lakes and lagoons, and, except in the breeding-season, does not seem to affect ordinarily the vicinity of fresh water. It is often met with in small troops of from three to six or seven, but has also a tendency to pack in flocks, probably before and during its migration. Von Middendorff remarks that when wounded it swam and dived perfectly; its webbed feet, as a matter of fact, are adapted to make it quite at home on water. When separated by the approach of danger, he says it gave out a piping note, which led him to believe it was one of the *Totanus* group. In its breeding-haunts on the Petchora Mr. Seebohm notices that it is "extremely fond of running over the bits of floating drift-wood on the submerged outskirts of the forest, uttering its musical *tir-r-r-whui*." Messrs. Alston and Harvie Brown write that they "were much struck by the arboreal habits of this species, which perches freely upon bushes or low trees, and runs along the branches with great ease, uttering a rapidly repeated cry of alarm, which may be expressed by the words *tluk, tluk, tluk*. When first started, or when flying from place to place, or dashing in and out amongst the alder thickets, the more musical double note is uttered, whence its Russian name of 'Kuleek.'" I find some further interesting and more detailed notes on the Terek Sandpiper's habits, as observed in Northern Russia, transcribed by Messrs. Sharpe and Dresser from the writings of Baron Count von Hoffmannsegg and K. G. Henke in the 'Allg. deutsche natur. Zeitung' for 1856; and from these I subjoin

the following extract:—"The note of the male, which is probably its pairing-call, is clear, loud, and full from the throat. It is uttered, and often repeated, from a stone, root of a tree, a hillock, or any similar elevated position, the bird moving its body and apparently exerting itself in calling. The note is of three syllables, and sounds like *kuwitzzöö*, *kuwitzzzöö*, *kuwitzzzöö*, or also *gizzööüd*, *gizzööü*, *gizzööüd*, the last syllable always rising higher and being more drawn out; sometimes a low, flute-like, melancholy note (*hahiaaa*, *hahiaaa*, *hahiaaa*) is uttered immediately after, when the former call has been often repeated. . . . The peasants call the bird, very correctly, after its note, *Kuwitri*, whereas they scarcely distinguish the other species of long-billed Sandpipers."

Nidification.—The Terek Sandpiper breeds in Northern Siberia and Northern Russia, but not south of lat. 60°; and it has been observed as high as lat. 70°. The latest notes which have been published on its breeding are those from the pens of Messrs. Alston and Harvie Brown, who were so fortunate as to find it nesting in abundance at the mouth of the Dwina in June 1872. These gentlemen describe the nest as "simply a slight saucer-shaped hollow in the ground, lined with chips of wood and bits of thick reed, and is placed in open marshy parts of the alder thickets, by the sides of 'Kourias' or creeks, or in the sand amongst bent grass."

The eggs of this species are pointed ovals in shape, and of a stone-yellow ground-colour for the most part, though some are browner than others. They are rather openly marked with blotches of dark sepia over faded spots of purple and bluish grey of several shades, which in some cases blends with the large blots of brown. Some eggs are distantly marked, while in others the colouring is chiefly at the large end in the form of softened irregular clouds. In one or two specimens before me there are a few pencillings or streaks intermixed with the blotches, making the eggs decidedly handsome. Some measure 1.47 by 1.0 inch, others 1.55 by 1.08 and 1.4 by 1.06. The series here described are in the collection of Mr. Dresser. Messrs. Alston and Harvie Brown rightly observe that the eggs in many instances resemble those of the Common Sandpiper, and further remark that they bear no resemblance to those of *Limosa*.

Genus TOTANUS*.

Bill long or moderately so, slender, straight, in some slightly recurved; both mandibles channelled in the basal half, the lower faintly so; nostrils linear, placed near the margin, tip of the upper mandible slightly bent. Wings long and pointed, the 1st quill the longest; tertials lengthened. Tail moderately short, scarcely exceeding the closed wings, rounded at the tip. Legs long; the toes connected at the base by a small web, most developed between the outer and the middle toe.

Sternum, as in other Scolopacine groups, variable, but usually with two emarginations or open foramina.

* The present genus comprises a number of birds bearing, in outward form, a general resemblance to one another, but almost all differing from each other in some point, either as regards bill and feet, or change of plumage in summer. The most aberrant forms under consideration in this work are:—the first, by reason of its bill and the single notch in the sternum; the Common Redshank, on account of its highly-webbed feet; and the Green Sandpiper, as also possessing a single emargination in the sternum and a very abnormal mode of nidification.

TOTANUS GLOTTIS.

(THE GREENSHANK.)

Scolopax glottis, Linn. Syst. Nat. i. p. 245 (1766).

Scolopax canescens, Gm. ed. Syst. Nat. i. p. 668 (1788).

Totanus glottis, Bechst. Orn. Taschen. Deutschl. ii. p. 287 (1803); Gould, B. of Eur. iv. pl. 312 (1837); Horsf. Tr. Linn. Soc. xiii. p. 192 (1821); Blyth, Cat. B. Mus. A. S. B. p. 265 (1849); Middendorff, Sibir. Reise, p. 213 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schlegel, Mus. P.-B. *Scolopaces*, p. 61 (1864); Jerdon, B. of Ind. iii. p. 700 (1864); Blyth, Ibis, 1867, p. 169; Newton, *t. c.* p. 351; Swinhoe, P. Z. S. 1871, p. 405; Holdsw. P. Z. S. 1872, p. 475; Ball, Str. Feath. 1874, p. 431; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1169 (1874); Salvadori, Ucc. di Born. p. 328 (1874); Legge, Ibis, 1875, p. 402; Walden, Tr. Z. S. 1875, ix. p. 234; Butler & Hume, Str. Feath. 1876, p. 18; Hume, *ibid.* 1878 (B. of Tenass.), p. 463; Ball, *ibid.* vii. p. 229; Cripps, *t. c.* p. 304; Hume, *ibid.* 1879 (List Ind. B.) p. 113.

Totanus glottoides, Vig. P. Z. S. 1831, p. 172; Gould, Cent. Him. B. pl. 76 (1832); Kelaart, Prodromus, Cat. p. 134 (1852).

Limosa glottoides (Vig.), Sykes, P. Z. S. 1832, p. 163.

Totanus horsfieldi, Gray, Gen. B. iii. p. 573 (1846).

Glottis glottoides (Vig.), Gould, B. of Austr. vi. pl. 36 (1848); *id.* Handb. B. of Austr. ii. p. 265 (1865).

Totanus canescens (Gm.), Adams, P. Z. S. 1859, p. 169; Sharpe & Dresser, B. of Eur. pt. 5 (1871); Shelley, B. of Egypt, p. 256 (1872); Hume, Str. Feath. 1873, p. 247, et 1874, p. 299; Irby, B. of Gibraltar, p. 165 (1875); Scully, Str. Feath. 1876, p. 189; Armstrong, *t. c.* p. 344; Hume, *t. c.* p. 465.

Cinereous Godwit, Latham; *der hellfarbige Wasserläufer*, German. *Mashak yamgurchi*, Turki (Scully); *Aoashi-chidori*, Japanese (Blakiston); *Timtimma*, *Tuntuna*, Hind., from its call; *Gotra*, Bengal. (Jerdon); *Peria kotan*, Tamil; *Maha oliya*, Sinhalese.

Adult male and female (Ceylon). Length 13.5 to 14.4 inches; wing 7.5 to 7.9; tail 3.3 to 3.5; tarsus 2.5 to 2.7; bare tibia 1.1 to 1.4; middle toe and claw 1.5 to 1.6; bill to gape 2.45 to 2.5.

Iris light brown; bill bluish leaden at base, changing to brownish towards the tip, in some dusky plumbeous throughout, with the base beneath bluish; legs and feet bluish leaden, the toes and tibia somewhat greenish, in some greenish blue, with the lower part of tarsus only bluish.

Winter. Head, hind neck, upper back, scapulars, tertials, and wing-coverts cinereous brown; the feathers, except on the head and neck (where they are broadly edged with white), with dark shafts, and a row of marginal alternate dark and white spots, formed by the light edges being indented with darker brown than the feather; on the interscapular region the edgings are whitish, with an inner margin of brown; longer scapulars and tertials overcast with a greyish brown, very strong in the newly-moulted feather; centre tail-feathers white at the base, washed towards the tip with ashy grey, the rest white, barred and streaked on the outer web with brown, the markings diminishing towards the outer feather; quills dark brown, the inner primaries and the secondaries finely tipped with white; 1st primary-shaft white; forehead, supercilium, orbits, face, throat, and all beneath, back, rump, and upper tail-coverts pure white, blending into the striped neck-sides; axillaries sparingly crossed with narrow brown bars, or almost pure white; under wing-coverts white, handsomely centred with brown; a series of dark spots through the lores, and another down the centre of the forehead.

In many examples the centre tail-feathers are devoid of the grey wash, being barred and marked like the rest, but more heavily; some have the under wing-coverts very openly marked with brown. The plumage of this species, as in *Tot. calidris*, is very smooth to the touch.

Summer plumage (Hankow, April). Wing 7·8 inches; tarsus 2·5; middle toe and claw 1·5. Head blackish brown; centre of frontal feathers the same, broadly margined with white; hind neck and wing-coverts dark brown; the scapulars, interscapulars, and tertials patched with deep black, some of the feathers almost entirely so; others pencilled with black round the edges; tail crossed with narrow wavy bars of black; face, fore neck, and chest streaked with blackish brown, continued upon the flanks; under wing-markings darker than in winter. From another specimen (April) it appears that the black coloration commences at the shaft, and spreads over the feather gradually.

An example from Norway has the markings of the fore neck, chest, and flanks very broad; consisting of central drop-shaped spots; the interscapular region is almost uniform black, and the ground-colour of the tertials very dark; the lower flanks are barred distantly with blackish brown. Wing of a female 7·2 inches; of a male 7·7 inches.

Nestling in down (Norway). Head and hind neck whitish, with a triangular patch of black on the crown; a small spot above the eye, a line through the lores, expanding into a broad streak over the ears black; the triangular coronal patch is streaked with whitish; back warm buff, with an irregular black streak down the centre, and other longitudinal irregular marks on the sides; a black band on the wing; beneath whitish, tinged with grey on the throat; tail blackish.

Immature (August, Pagham). Head darker than in the adult in winter; upper back and scapulars blackish brown, the feathers margined with fulvous; lesser wing-coverts blackish brown, the greater series edged with tawny grey; the tertials, which are dark brown, indented with the same; bars on the tail broad and blackish, and all the feathers white, but with a buff tinge; beneath white, the chest and flanks crossed with blackish-grey pencilings, and the sides of the throat boldly striated with blackish brown. The plumage of the chest is the most distinguishing characteristic.

Obs. This species differs slightly from the rest of the genus in the bill, which is slightly upturned from the centre to the tip, which is well pointed. It forms the type of the genus *Glottis* of Nilsson.

The dimensions of Indian examples are as follows:—♂, Sindh: length 13·0 inches; wing 7·5; tail 3·4; bill at front 2·05; tarsus 2·36 (*Hume*). ♀, Yarkand: length 13·35 inches; wing 7·65; tail 3·75; tarsus 2·35; bill from gape 2·45; weight 4·85 oz. (*Scully*). Mr. Cripps gives the measurements of females as:—length 14·5 to 15·0 inches; wing 7·33 to 7·5; tail 3·0 to 3·25; tarsus 2·33 to 2·5; bill from gape 2·3 to 2·52; weight 6·12 oz.

Distribution.—The Greenshank, one of the most widely-distributed species of this group, is for the most part a winter visitor to Ceylon, arriving in September and leaving in April; but numbers remain throughout the year, and are most likely birds which have not arrived at maturity and are not breeding. I have noticed them in quantity at Kanthelai tank in July and August, and likewise in the former month at many of the salt lagoons in the Hambantota and Yāla districts. In similar situations on the north-east coast I never saw them at this season; and as far as the Jaffna peninsula is concerned, I am unable to speak, not having been there during the S.W. monsoon. They are to be found on all the muddy tidal lagoons, estuaries, salt lakes, &c. on the north, north-west, and north-east coasts, as also down the eastern side of the island to Hambantota, and westward of that place towards Tangalla. It is common near Negombo; but I never met with it south of that place on the west coast nor in the Galle district, though I believe it is now and then found between Negombo and Matara in the extreme south. Though very common within the above-mentioned limits, it is not very numerous, as it is not found anywhere in large flocks, but only in small parties or even singly or in pairs. It is likewise partial to particular localities; for I have observed it to be less numerous at some salt lagoons than at other adjacent ones. I found it less abundant on the north-west coast than on the opposite side of the island; but Mr. Holdsworth remarks that it is very common at Aripu. In the interior I have only seen it at Kanthelai; but it doubtless finds its way to Minery and Padwiya tanks, and other large sheets of water, and it probably ascends the Mahawelliganga river into the Tamankadua Pattuwa.

This species is spread throughout the three continents of the Old World, extending from Eastern Asia through the Malay Archipelago to Australia and Tasmania; and also occurring in America, having been observed in Florida, and in South America as far south as Chile.

It is an abundant species in India. Jerdon remarks that it is to be seen in all parts of the country; and, as a matter of fact, we find that, in addition to being diffused all round the coasts in suitable localities, recent observations prove that it occurs in all districts in the interior which have been examined. It is common in the Deccan and throughout the region between the Godavari and the Gauges. About Calcutta, Messrs. Blyth and Hume state that it is abundant; and in Furreedpore, "it is very common along rivers and creeks." It has been obtained at Umballa, and in parts of the north-west it musters in great force. Mr. Hume styles it extraordinarily abundant in the Punjab (50 being sometimes seen in a flock) and very common in Sindh: in the Guzerat district it remains until the end of May, and is sparingly distributed throughout it; it is likewise found in Kutch and Kattiawar, but in many localities is said to be "far from common." It was procured in Sikkim in spring by Capt. Bulger. Mr. Hume met with it on the island of Cardamum in the Laecadives, but elsewhere in that group found it absent. In Upper Pegu it is reported to be occasionally met with; but in the Irrawaddy Delta it is very abundant. In the Province of Tenasserim, Mr. Hume says it is common everywhere inland and on the coast; he does not record it from the Andamans, which is a noteworthy fact, considering that it is abundant on the mainland; but it has been procured in the Nicobars according to Herr von Pelzeln. I do not find any note of its occurrence in Sumatra; but in Java it has been obtained by Kuhl and Von Hasselt. It is probably found sparingly all round Borneo, as it has been recorded from the south of the island from Pontiniak and Tahanio. In Celebes it has been recently observed by Herr Meyer, who found it there in June and July; and previously it was procured there by Forster and S. Müller, which latter naturalist also obtained it in Timor. In New Guinea it will probably be found, although I find no data of its occurrence in the works of reference to which I have access; but in Australia it is distributed round the entire coast, and has been found in the Richmond and Clarence-river district (*Ramsay*). Gould remarks, as regards its general distribution in this region, that it is nowhere abundant, but that it is generally dispersed over the shores of the continent and Tasmania. Turning north again, we find that in the Philippines it has been obtained in Luzon, and, by Cuming, in another locality which has not been specified. In Hainan Swinhoe found it very abundant at the Hoehow Marsh in March; and on the mainland of China it is generally distributed in winter. In Formosa the same writer met with it in April. As regards the Japanese islands it is said to be common in Yezo. It is found on the coast of the Sea of Okhotsk, and is common, according to Middendorff, in the breeding-season in the Stanowoi mountains, inhabiting the morasses on their slopes. It probably breeds in other parts of Northern Siberia, but it has been overlooked by recent travellers in that region. In Turkestan it was procured by Dr. Scully in October at Kashgar, and in August on the Karakash river. The Yarkandis say that it is found there near "running water or near pools and swamps; it disappears entirely in winter, but breeds in Eastern Turkestan in summer." Severtzoff notes that it occurs on passage in Northern and South-eastern Turkestan, and breeds on grassy steppes up to 4000 feet elevation. Przevalsky observes that it is "an occasional visitor to the Hoangho, and a migrant through Gobi about the end of August. We did not," he says, "observe it anywhere else in Mongolia. It appears in limited numbers at Lake Hanka late in April; and single individuals are to be met with throughout the summer there, as well as on the Ussuri. In August it becomes again more abundant."

It winters in Palestine, and frequents the coast of Arabia likewise, for Wyatt observed it on the shores of the peninsula of Sinai. It is found in winter in Turkey, the Mediterranean islands, and Spain, in which latter country Mr. Saunders observed it until the end of May. It occurs in Southern Andalusia on passage from its winter quarters in Africa in March, April, and May. It is said to breed in Transylvania, in which province it is common during autumn. It also nests in Germany; but its proper summer quarters are the north of Scotland, the Hebrides, Denmark, Scandinavia, Finland, and Northern Russia. Messrs. Seebohm and Harvie Brown saw it on the Petchora at Ust Zylma on the 19th May, and afterwards found it abundant at Ilabariki. Turning now to Africa we find it inhabiting in winter the entire north coast from Tangier, where it chiefly occurs on passage in autumn and spring, to Egypt, throughout which country and Nubia it is, according to Captain Shelley, plentifully distributed, frequenting the banks of the Nile and the marshes of the Delta. Von Heuglin states that it is met with on the shores of the Red Sea as far south as the coast of Somaali, and along the Nile and its tributaries from August until April. He met with it once in the highlands of Abyssinia, and remarks that it is common in East Kordofan. Down the east coast it has been met with at Zanzibar and

at Mozambique; and it strays eastward still to the Seychelles, in which it has been noticed by Mr. E. Newton on Mahé and Curieuse islands. In South Africa it winters, and has been obtained in Natal and on the Limpopo river, where Mr. E. Buckley writes, in the 'Ibis,' that it is common. Layard remarks that in Cape colony it is common, and found on almost all the vleys throughout the country.

In Damara Land it is plentiful; and up the west coast of the continent it has been obtained in Benguela, Gaboon, and Prince's Island, also on the Gold Coast and in Senegambia. In Madeira it has occurred, according to Von Heuglin; and it is a straggler to some parts of the coast of North America.

Habits.—This very fine Sandpiper frequents the same situations as the rest of its group, being found on the borders of tidal rivers, salt creeks, lakes, and lagoons, on sand banks (about which its long legs enable it to walk before they are left bare by the tide), and also on the open beach. It is also, to a certain extent, a fresh-water species, frequenting the borders of tanks, jheels, and marshes; but about such localities it is found chiefly on passage and while breeding. I have always in the winter observed it, either singly, two or three together, or in little companies of not more than half a dozen, and it is frequently accompanied by a few other birds, such as its lesser companion, the Little Greenshank, and perhaps one or two Curlew and Lesser Stints. When wading in water, however, it is only the first-named bird, owing to the length of its legs, that is able to accompany it. While feeding, its manners are somewhat those of the Common Redshank; it walks hither and thither, pecking on one side and the other like that species; but it can always be recognized by its greater height, and, when it flies, by its peculiar note and the less amount of white displayed. It is tolerably wary, but will often allow itself to be walked up to within shot; when it rises it utters a loud note unlike that of other species of its group, and which consists of three syllables, the two loudest of which have been likened to *tung tung*. It feeds on small crabs to a considerable extent, which it finds on the muddy foreshores of tropical lagoons; but it also consumes aquatic insects, for which it searches in wet marshes and salt flats, near the edge of the tide, which are only covered just at high water. In little pools lying in such localities it may often be seen wading. The flesh of the Greenshank is very good eating, as there is an absence of any fishy taste about it, and it is not at all dry.

In the spring, prior to migration, it collects in large flocks of fifty or more, and shortly afterwards leaves for northern latitudes. In the Stanowoi mountains, Middendorff noticed it perching, "with much noise," on the tops of low trees growing round the morasses. In the Petehora valley, Mr. Seebohm found it frequenting marshy hollows and pools in the woods.

The flight of the Greenshank is very swift, and it has a habit of suddenly alighting, which is a somewhat difficult matter while flying with its accustomed speed; and to enable it to stop itself it half closes its wings and sways its body with a jerking motion from side to side, and then, throwing up its head, spreads out its wings in a position slightly inclined to the vertical, which at once brings it to a halt. I have on several occasions noticed this performance, and I find that other naturalists have observed the same thing. It is said to become very tame in confinement.

Nidification.—The Greenshank breeds in May and June; on the 12th of the former month Middendorff found it already at its breeding-haunts in North-eastern Siberia; and its eggs were taken by Messrs. Seebohm and Harvie Brown on the Petehora on the 11th of June. The nest is said to consist of a hollow scraped in the ground, lined with grass-stalks, feathers, leaves, and other dried vegetation.

The eggs of the Greenshank are four in number, and vary somewhat in size and shape, some being broad and pyriform, and others very long and pointed, without being much compressed at the small end. In colour they are mostly stone-buff or greyish buff, some having a slight olivaceous tinge. The markings vary from large blackish-sepia clouds, few in number, but distributed over the whole egg, to numerous rather smudgy blots and longitudinal dashes of lighter brown, mingled with bluish-grey blotches of several shades scattered over the whole surface. Small specks and short linear marks are mingled with these in some eggs, and large bluish dashes underlie at the obtuse end the first-named dark clouds of blackish brown, some of which run in a transverse direction. An egg of the broad type measures 1.87 by 1.35 inch, and of the elongated type 2.08 by 1.27. A smaller egg than either is 1.86 long by 1.24 broad. The specimens from which I take these descriptions are in the possession of Mr. Dresser, and were collected in Lapland and Finmark.

TOTANUS STAGNATILIS.

(THE LITTLE GREENSHANK.)

Totanus stagnatilis, Bechst. Orn. Taschenb. ii. p. 292 (1803); Gould, B. of Eur. iv. pl. 314 (1837); id. B. of Austr. vi. pl. 37 (1848); Blyth, Cat. B. Mus. A. S. B. p. 266 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 701 (1864); Layard, B. of S. Afr. p. 324 (1867); Swinhoe, P. Z. S. 1871, p. 407; Sharpe & Dresser, B. of Eur. pt. 1 (1871); Holdsw. P. Z. S. 1872, p. 475; Shelley, B. of Egypt, p. 257 (1872); Adam, Str. Feath. 1874, p. 338; Legge, Ibis, 1874, p. 29; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1159 (1874); Salvadori, Ucc. di Born. p. 328 (1874); Hume, Str. Feath. 1875, p. 183; Legge, Ibis, 1875, p. 402; Danford & Harvie Brown, *t. c.* p. 420; Butler & Hume, Str. Feath. 1876, p. 18; Armstrong, *t. c.* p. 348; Hume, *ibid.* 1878 (B. of Tenass.) p. 463; Davidson & Wender, *ibid.* 1878, vii. p. 89; Hume, *ibid.* 1879 (List B. of Ind.) p. 113.

Totanus tenuirostris, Horsf. Tr. Linn. Soc. xiii. p. 192 (1821).

Limosa horsfieldi, Sykes, P. Z. S. 1832, p. 196.

Totanus lathamii, Gray & Hardw. Ill. Ind. Zool. pl. 51. fig. 3 (1833-4).

La petit Chevalier à pieds verts, Cuv.; *Barge grise*, Buffon, Pl. Enl. p. 876; *Marsh-Sandpiper* of some writers; *Snippet*, *Sandpiper*, Europeans in Ceylon. *Chota gotra*, Bengal. (Jerdon); *Kotan*, Tamils in Ceylon.

Adult male and female. Length 9·7 to 10·2 inches; wing 5·5 to 5·75; tail 2·3; tarsus 2·05 to 2·25; bare tibia 1·0 to 1·2; middle toe and claw 1·2 to 1·3; bill to gape 1·65 to 1·7.

Iris hazel-brown; bill dark brown, greenish at the base beneath; legs and feet bluish green.

Winter plumage (Ceylon). Very similar to the last in general character. Upper surface paler, especially on the head, hind neck, and greater wing-coverts; the head and hind neck with dark mesial lines, and the feathers of the back and wing-coverts wanting the dark indentations and inner edges; the tertials in some boldly marked with a streak parallel to the edge, or with zigzag bars departing from a dark mesial stripe; centre tail-feathers washed with pale ashy or reddish cinereous, and handsomely barred with irregular blackish markings, the terminal one being in general arrow-shaped and following the edge of the feather: face whiter than in the last, the frontal and loreal stripes being wanting.

The markings of the tail are very variable, scarcely any two examples being alike.

Spring plumage (Africa). Wing 5·3 inches; tail 2·4; tarsus 2·0; middle toe 1·05; bill to gape 1·7.

The feet are said by Nordmann to be occasionally reddish black, slightly tinged with greenish on the articulations.

Feathers of the head, hind neck, and interscapular region with black centres and rufescent-grey margins, the ground-colour of the latter, together with that of the scapulars, isabelline-grey, with handsome black central blotches and shaft-stripes of the same hue; tertials and inner median coverts the same, crossed with angular marks of coal-black; wings slightly darker than in winter; tail much the same, but with broader bars; face, front and sides of neck with black linear marks; chest and centre of the breast unspotted white, but the sides of the breast with cross marks and central lines of black; under tail-coverts with a few black shaft-stripes.

This plumage is acquired, as a rule, early in the spring. Mr. Hume speaks of a specimen shot in February, on the Irrawaddy delta, in full summer plumage. Individuals in this dress vary considerably, the black markings being longer and more handsomely distributed in some birds than in others.

Immature (July). Head, upper back, and wing-coverts blackish brown, the feathers margined with fulvous, broadly

on the scapulars and wing-coverts; the tertials indented with the same at the margins; nape and hind neck greyish brown; centre tail-feathers barred with brown, the remainder pencilled round the edges, the tips tinged with rufescent; lores and supercilium white, with a dark stripe through the former; sides of the chest with cross "shadings" of brown.

Obs. This species is remarkable for the slenderness of its bill. It is very slightly turned up, or rather depressed in the centre, the tip being again curved downwards. In winter plumage it is more entitled to the name of Greenshank than the last-named, the legs of which are more blue than green. As regards size noted by other observers, Dr. Armstrong gives the following measurements:—"Length 10.2 to 10.7 inches; wing 5.2 to 5.3, expanse 15.5 to 16.2; tail 2.6 to 2.85; tarsus 2.0 to 2.03; bill from gape 1.7 to 1.75." I find that in series of European examples the wing varies from 5.1 to 5.4.

Other species of Asiatic Sandpipers are *Totanus incanous*, which has an easterly range from North-eastern Siberia down through the Malay Archipelago to Australia, extending likewise through Oceania to America; and a singular local Burmese form discovered by Dr. Armstrong, and named *Pseudototanus haughtoni*. This bird is said to be somewhat allied to the last species, but has a more massive, broader, and blunter-tipped bill, and also shorter legs than a typical *Totanus*; and Mr. Hume has therefore placed it in a new genus. I have not had the pleasure of seeing a specimen; but Dr. Armstrong gives the length of a pair as 12.9 (♀) to 13.2 (♂), wing 7.0 to 7.3, tarsus 1.65 to 1.85, bill 1.93 to 2.1 respectively. The plumage appears to resemble somewhat that of the Greenshank. I extract the following from this writer's description:—"The upper surface is cinereous grey, the feathers with central stripes; lower back, rump, and upper tail-coverts white, with dusky terminal spots; the under surface, under wing, and axillaries pure white, the sides of the neck with narrow dark shaft-stripes; tail greyish white, margined and tipped with pure white, the central feathers brownish; primaries hair-brown; secondaries dusky brown, with white margins and tips.

Distribution.—The Little Greenshank, or "Marsh-Sandpiper," is the most abundant of its genus in Ceylon, arriving in numbers at the end of September and departing in May. Some, however, remain throughout the year, not a few birds having been seen by myself in the Hambantota district and at Kanthelai tank in July and August. It is found in the same localities as the last, viz. round the north coast down to Chilaw on the west, and all along the eastern side of the island to Hambantota on the south, frequenting salt lagoons, tidal flats, marshes near the sea, estuaries of rivers, salt-water creeks, and so forth. It is no doubt a frequenter of the Negombo Lake, and may be found as a straggler further down the west coast. Mr. Holdsworth remarks that it is very abundant at Aripu; and I noticed it there in creeks, and found it common at Manaar; but, on the whole, I did not remark that it was quite as numerous on the west coast as on the east. The great chain of salt lagoons between Mullaitivu and the Virgel, as also the Batticaloa Lake and the leways on the south-east, are frequented by numbers of this species. It ascends the Mahawelliganga for some distance, and is found, as I have remarked, as far inland as Kanthelai. It may possibly occur at Minery and at the Anaradhapura tanks.

Though possessing a very wide range, it is not spread over as much territory as the last species, not being found in America, and having in Europe neither a westerly nor a very northerly habitat; and, notwithstanding that it seems almost entirely to avoid Spain and Portugal, it is said to be common on the West-African coast.

It is common here and there throughout the Indian empire; but is not at all evenly distributed, being common in many localities, and curiously absent from intervening places. Jerdon says of it that it is less generally spread than perhaps any of the preceding species; he saw it in large flocks on the Trichoor lake in South Malabar, and he obtained it occasionally in various parts of the country. In the Deccan it is said to be common; and at Ahmednagar, in the Khandala district, the Rev. Dr. Fairbank obtained it. It is not recorded by Mr. Ball from any part of the district he examined; and from Mr. Cripps's Furreedpore list it is absent. It is found about Calcutta, but is not so numerous as the preceding species. In the north-west it is not very common; at Sambhur Mr. Adam only once met with it; and in Guzerat Captain Butler says it only occurs sparingly throughout the tank country, remaining till the end of May. Mr. Hume adds that it is not uncommon in suitable localities in Jodhpur, but that he had not received it or heard of it from Sindh, Cutch, or Kattiawar. It is evidently a bird which prefers a more southerly winter habitat along the meridian of its migration; and it therefore passes over India, pushing on to Ceylon, where it is stopped by the Indian Ocean, and consequently lodges in great numbers in that island.

In Pegu it occurs occasionally; but in the Irrawaddy delta it is more common, though "by no means abundant" (*Armstrong*). Southward in Tenasserim it is very rare, only having been procured once by Mr. Davison's collecting party near hot springs on the Attaran river. It is absent from the Andamans and Nicobars, and has not been procured in Sumatra. It is, however, recorded from Java, where it was obtained by Kuhl and Van Hasselt. In Borneo it was procured by Schwaner. It is a straggler to Australia; and it therefore must visit many of the intervening Malay islands on its way thither, its course of migration being most likely a direct one from Java and Borneo, through the Timor chain. It does not seem to go to the eastward at all, as I find no record of its occurrence in Celebes, the Moluccas, or Papua, and it furthermore does not occur in the Philippines. In Australia Mr. Ramsay records it from the Wide-Bay District; and Mr. Gould procured a solitary specimen on the banks of the Lower Mokai in New South Wales, in December 1839. Turning north again, we find that it occurs on passage on the coast of China; and Swinhoe obtained it in Hainan in February, and likewise in Formosa. It is not recorded from the Japanese islands, appearing to keep to the mainland in its northward passage. Middendorff and Schrenk both omit it from their works; and Przevalsky did not meet with it in Mongolia or the Tangut region; and, finally, Messrs. Finckh and Seeböhm did not observe it in Northern Siberia; Professor Nordmann, however, in Demidoff's 'Voyage,' intimates that it is found in Siberia. In Yarkand Dr. Stoliczka observed it during the first half of the winter, and records that it disappeared in December. Dr. Seally did not meet with it; but Severtzoff says that it breeds in Turkestan in the north and south-east, and is found up to an altitude of 4000 feet. In Palestine Canon Tristram observed it in winter; but it does not seem to be recorded from Asia Minor, and it is rare in Turkey. In the island of Corfu it was obtained by Lord Lilford. Its habitat in Europe is chiefly central; it occurs mostly in the south and in the Mediterranean islands on passage in spring, and breeds in Hungary and on the waste lands bordering the Danube, as also in Southern Russia. In Transylvania it is likewise common in spring and autumn; and the evidence as to its breeding there rests upon Herr Frivaldsky's obtaining it in the breeding-season; this naturalist has taken the eggs at Opatowitz, in Hungary, and has seen the young near the Platten See. It is rare in France and Germany, as also in Holland, and is the only member of the group which has not occurred in England. It has been obtained once by Herr Gätke in Heligoland, an old male having been taken there on the 7th May, 1862; but it has not been observed as yet in Scandinavia. I find no record of its occurrence in Spain, with the exception of Mr. Saunders's statement that there is a single specimen in the museum at Barcelona. It is not uncommon, however, on the west coast of Africa; Capt. Shelley found it plentiful at Accra and at Cape-Coast Castle, and it has been obtained in Gambia and Ashantee. It is uncommon in South Africa: Layard procured it at Colesberg and George, and further remarks that Mr. Ayres obtained it in Natal.

Von Heuglin states that it is found in winter on the Blue and the White Nile, and especially in the marshes of East Kordofan; in March he observed it at the Tana Lake in Abyssinia, and in April and May in breeding-plumage on the spring torrents of East Senaar, and also at Alexandria at the beginning of August. It is natural, therefore, to infer that it may breed in Abyssinia. As regards Egypt, Captain Shelley writes as follows:—"The Marsh-Sandpiper ranges throughout Egypt and Nubia, but is not very plentiful on the Nile above Cairo, where we generally met with it singly or in company with the Wood-Sandpiper. In Lower Egypt and the Fayoom it is far more numerous, and in these districts I may have seen as many as a hundred in a day."

Habits.—This elegant Sandpiper is one of the most interesting of the genus *Totanus*, on account of the vivacity of its manners, the activity of its movements, and the tameness of its disposition. Besides frequenting tidal flats, sand banks, muddy foreshores, &c., it is very fond of resorting to little pools in wet salt marshes, which are filled daily by the tide, and shallow enough when the water has receded for it to wade about in. Here it is generally seen, in Ceylon, in company with the Long-toed Stint (*Tringa subminuta*); and as soon as it is met with it is sure to attract particular attention by its actions. Strutting quickly about, this way and that way, with its bill in and out of the water, snapping up the luckless larvæ right and left, taking a quick little run to one side and then to the other, and seemingly quite unconscious of the doings of its little companions, who are likewise plying a busy trade in the shallower water all around it,—if there ever was a greedy hungry-looking bird, intent on gobbling up every thing that comes in its way in the shortest possible space of time, it is

the "Marsh-Sandpiper" at work on one of these little tidal pools. But fire into the busy troop, and, as is sometimes the case when birds are scattered, miss them clean! It is then that we discover the true nature of our Little Greenshank. Up he starts, screaming and piping with rage, and, after flying round and round the pond, still fussing and fuming at having been so rudely disturbed, he settles down quickly, and commences to hunt anew, screaming all the while as if it were impossible to exhaust his rage, until he espies the looked-for quarry and suddenly relapses into silence.

It is often to be seen consorting with its larger relative, as its long legs enable it to feed in just as deep water as that species, and occasionally it associates with the Wood-Sandpiper. As a rule, it is generally observed in little parties of two, three, or four, and is often found singly. At times I have seen it in little troops of more than a dozen, tightly packed together, and assembled evidently to "work" some particularly promising spot; they all advance in the same direction, with their heads down, rapidly scooping up the tiny crustaceans and larvæ on which they feed. Small univalves and other minute shells are to be found in its stomach, and I think aquatic insects form the least part of its food. It seldom, as far as I have been able to judge, frequents fresh water in Ceylon, though it may occasionally be seen in paddy-fields; but in India Jerdon found it in "young rice-fields and open marshy spots." Its flight is swift, and has the same darting gliding character as that of other Sandpipers. Mr. Thos. Robson, in writing to Messrs. Sharpe and Dresser, remarks that they rest within the edges of marshes with muddy bottoms, on one leg; and when disturbed they hop out and rise from one leg.

Nidification.—As stated above, Severtzoff says that the Little Greenshank breeds in Turkestan in the northern and south-eastern districts of the country. We learn nothing, however, of its nest and eggs from his writings. It has, however, been found nesting in Hungary in June; and Mr. Dresser received its eggs from the Curator of the Pesth Museum. There are no details of the nest published by any author to whose works I have access; but it is to be inferred that the nest is similar to that of the last species. I find from an examination of a series that the eggs vary in ground-colour from dull clay-stone to olivaceous grey; they are moderately pyriform in shape, and are very handsomely and richly marked, some with very dark almost black straggling blotches, running into hieroglyphic-like dashes, over blots of paler brown and specks of bluish grey, and others with moderately-sized rather round blots of deep sepia, chiefly distributed over the large end, mingled with smaller specks and underlying washes of bluish grey. In one egg the large straggling clouds take an oblique direction, and impart a very handsome appearance to it. One egg in a series of five measures 1.64 by 1.06 inch, and another 1.49 by 1.07. These eggs, which were taken in Lapland, are in the collection of Mr. Dresser.

TOTANUS FUSCUS.

(THE DUSKY REDSHANK.)

Scolopax fusca, Linn. Syst. Nat. i. p. 243 (1766).

Totanus fuscus (Linn.), Bechst. Orn. Taschenb. ii. p. 286 (1803); Gould, B. of Eur. p. 309 (1837); Gray & Hardw. Ill. Ind. Zool. ii. pl. 53 (1833-34); Blyth, Cat. B. Mus. A. S. B. p. 266 (1849); Middendorff, Sibir. Reise, p. 214 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 702 (1864); Layard, B. of S. Afr. no. 615 (1867); Swinhoe, P. Z. S. 1871, p. 406; Holdsw. P. Z. S. 1872, p. 475; Shelley, B. of Egypt, p. 255 (1872); Gould, B. of Gt. Brit. pl. 55 (1873); Hume, Str. Feath. 1873, p. 248; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1167 (1874); Irby, B. of Gibraltar, p. 166 (1875); Dresser, B. of Eur. pt. 40 (1875); Butler & Hume, Str. Feath. 1876, p. 18; Cockburn, *t. c.* p. 509; Seebohm & Harvie Brown, Ibis, 1876, p. 292; Blakiston & Pryer, *ibid.* 1878, p. 220; Hume, Str. Feath. 1878 (B. of Tenass.), p. 463; Ball, *ibid.* 1878, vii. p. 228; Hume, *ibid.* 1879 (List of Ind. Birds), p. 113.

Dusky Snipe, *Cambridge Godwit*, and *Black-headed Snipe*; *Black Snipe*, Lath. Synopsis; *The Spotted Redshank* of some. *Butan*, Hind.; *Yerra kal ulanka*, Telugu (Jerdon).

Adult male and female (British Museum, England and North India). Wing 6·4 to 6·6 inches; tail 2·8; tarsus 2·2 to 2·3; middle toe 1·2; bill to gape 2·4 to 2·65; depth of web of outer and middle toe 0·24.

The dimensions of a large series of winter specimens from Sindh are given by Mr. Hume as follows:—Length 12·9 to 13·3 inches; wing 6·5 to 6·9, expanse 21·0 to 22·0; tail from vent 2·9 to 3·2; bill at front 2·3 to 2·4; tarsus 2·3 to 2·4. Weight 7·5 to 9·0 oz.

A pair in summer plumage, shot by Mr. Cockburn, of the Allahabad museum, are recorded as measuring:—♂, length 13·0 inches, wing 6·25, tail 2·12, bill (at front?) 2·12; ♀, length 14·0 inches, wing 6·38, tarsus 2·25, middle toe 1·58, bill (at front?) 2·25.

Iris brown; bill black, base of under mandible and basal margins of the upper orange-red; legs and feet orange-red. Specimens shot in summer plumage (May) by Mr. Cockburn had *dark green* legs.

Male, summer plumage (Nepal, British Museum). Head, face, throat, fore neck, chest, and breast dull black; above the lores the feathers are streaked with white passing over the eye; face and sides and back of neck also streaked with white, the chin and fore neck less so; the flanks and the sides of the breast barred with white, and the breast-feathers tipped with the same; interscapular region, scapulars, and wing-coverts dark ashy brown, crossed with wavy softened bars of blackish, the lighter portions of the feathers changing to white at the margins, which is most conspicuous on the wing-coverts, which are also tipped with white; tertials similar to the scapulars; primaries and their coverts brown, the first shaft white, the remainder brownish; secondaries brownish, barred and tipped with white; back and upper tail-coverts white, the latter barred with blackish brown; tail *ashy grey*, barred with brown, the lighter portions white on the inner webs; sides of the rump like the upper tail-coverts; lower tail-coverts white, barred with blackish; axillaries pure white.

An example in change (*spring plumage*) is much the same as the above on the back; but the fore neck and under-surface feathers are in process of change to the black plumage, the dark portions of the feathers being chiefly in the form of bars; many of them have the entire terminal portion black, and some the centres, scarcely any two feathers being coloured alike.

Female. Differs in the less uniform hue of the under surface, and in having the chin white. An *August* example in full plumage (Obdorsk, Siberia) is white beneath, closely barred with blackish brown; fore neck and chest

blackish grey, much streaked with white; chin and throat white; head and loreal stripes blackish brown, the former slightly streaked with white; back and scapulars not so dark as in the above.

Winter plumage (England). Above brown, unspotted on the head and hind neck; a whitish stripe above the lores and one behind the eye; upper back and scapulars dark brown, with marginal white spots; wing-coverts with interrupted white bars and terminal lateral spots of the same; secondaries brown, barred with white, as are also the outer webs of the inner primaries; tertials indented with white; back white; rump, upper tail-coverts, and tail brown, narrowly barred with white—exactly the converse of the coloration in the Common Redshank; chin and gorge white, unmarked; the rest of the under surface white, with dark streaks on the fore neck and sides of the chest; legs dull red.

The change to the dark summer dress takes place by a gradual alteration in the colour of the lower parts, which first become barred with blackish brown, while the ground-colour of the upper surface darkens, the feathers at the same time assuming the black coloration.

Young in down. “Covered with down close at the base, but with the tips radiating out like hairs; upper parts variegated blackish brown and brownish buff; forehead buff, with one central dark stripe, which joins the blackish brown on the hind crown; a narrow blackish stripe passes also from the base of the bill through the eye to the hind neck; underparts dusky white, clouded with brownish buff on the breast and flanks.” (*Dresser.*)

Immature birds nearly resemble the adult in winter plumage, but have the under surface barred with sooty grey, and the chest striped with the same; wing-coverts, scapulars, and interscapulars tipped with whitish.

Distribution.—Layard includes this Redshank among the Waders he procured in the north of Ceylon; and I infer that it is a *straggler* to the island, probably occurring chiefly in the Jaffna peninsula. I have never met with it myself nor seen it in any collections made in Ceylon subsequently to Layard's time; and hence my reason for believing that it must be a rare bird in Ceylon, particularly as it is a species which has not a southerly range. Jerdon states that it is found throughout India in the cold season, either solitary or in moderate parties. From recent observations it would appear to be found chiefly in the north—Bengal and the north-western districts of the empire. It is not recorded from the Deccan; but the maritime districts of the south of the peninsula must be included in Jerdon's habitat, for he collected much in the south. Mr. Ball includes it in his list of birds from Chota Nagpur and the Godaveri, but cites only the Rajmehal hills and Birbhum as localities; from Raipur and Sambalpur it is noted by Mr. Hume, who likewise says that it is moderately common about Calcutta. It is not included by Captain Beavan nor Mr. Cripps in their lists. In the Punjab and in Sindh it is said to be very numerous in the cool season; and in the Mount-Aboo district, where it is found until late in May, it is “not uncommon” (*Butler*). It is found in Kutch and in Kattiawar too, and it is not common at the Sambhur Lake. At Allahabad Mr. Cockburn met with a large flock on the 8th of May in full breeding-plumage; and in the British Museum there are specimens in summer plumage collected by Mr. Hodgson in Nepal. I find no mention of it in Pegu or from the Irrawaddy delta; and in Tenasserim it has only been found at the mouth of the Sittang river. Its range does not extend to the Malay peninsula or the archipelago, nor has it, as yet, been found in the Philippines. It was procured in Formosa by Mr. Swinhoe; and in China he records it from Canton, Tientsin, and Shanghai. Przevalsky met with it in South-east Mongolia during spring migration. It is said to be common in Japan in Yezo; and I presume it is found there either late in the spring on passage or in summer. In Eastern Siberia Middendorff met with it, and writes that it breeds not unfrequently on the Boganida river, beyond which it extends into Kamchatka, and thence into the Aleutian Islands. It has not been met with in Kasgharia; but Severtzoff says that it occurs on passage in the north-western portion of Turkestan, and that it breeds there on grassy steppes and in cultivated districts up to 4000 feet. Mr. Seeborn does not appear to have met with it on the Yenesay; but on the great sister stream, the Ob, Dr. Finsch found it as far north as Obdorsk, which is at the mouth of that river and on the gulf of the same name.

In Europe it is a winter visitor to the southern portions of the continent, and is not uncommon in Spain, to the southern portion of which, Mr. Howard Saunders says, it is a regular migrant. The same may be said of Italy and Greece. In Sardinia it occurs in March on passage; and in Malta it is a regular migrant. In Transylvania it is not uncommon during migration; and it has been shot in June in that province. In Southern Germany, and also in Bohemia, it is commonly met with in autumn.

It breeds in Finmark and Northern Russia eastward to the Petchora, and also in Norway. On the last-named river Mr. Seebohm found it in small troops in June at Habariki, where it appeared to be breeding, but its nest was not found. Further north than this Von Heuglin considers he saw it on Waigats Island, between the north coast of Europe and Nova Zemla. In Southern Russia it only occurs on passage.

Going south again to trace out its African range, we find Col. Irby stating that it occurs on passage in spring and autumn at the Straits of Gibraltar, on the Tangier side of which Favier notes that it frequents salt marshes and lagoons in September and October. It was observed in Algeria by Loche; and in Egypt it is sparingly distributed, according to Captain Shelley, who met with it only at Sakkarah in Central Egypt on the 7th of April. Von Heuglin identifies a flock of eight birds which he met with at Ras Belul on the Red Sea in September as belonging to this species, but he was unable to procure a specimen. Layard procured one specimen at Kuysna in Cape colony.

Habits.—In India the Dusky Redshank frequents the borders of rivers and lakes on the sea-coast, and is also found about flooded marshes and in the vicinity of jheels. In the Point-Pedro district Layard probably met with it on the back-waters and on the muddy foreshores of the salt lagoons which intersect the Jaffna peninsula, and which constitute a paradise for all the Waders which visit the north coast of Ceylon.

Like its smaller congener last noticed it is generally shy and wary. It congregates more in flocks than the Common Redshank, although it may often be met with singly. In Sardinia Mr. A. B. Brooke noticed that they were "wild and independent, never seeming to care much for the company of other Sandpipers, but when disturbed separating at once, and generally flying a long distance before alighting." When in small flocks, feeding, it keeps in close company and walks quickly, picking up its food as it proceeds. Its diet consists of worms, aquatic insects, minute crustaceans, and the spawn of fish and frogs. It is said to be able to swim well and to dive on the approach of danger from a bird of prey or when being pursued after being wounded. Its note is a shrill whistle, which some writers liken to the syllables *tshweet, tshweet*. Naumann says that it utters a low note of welcome, like *tick, tick, tack*, when one joins its companions; and in the breeding-season it has a cry which Mr. Wolley likens to *tjeuty*. Mr. Dresser remarks that it frequents inland situations much more than the Common Redshank, affecting morasses where there are little open sheets of water.

Nidification.—The Dusky Redshank, as far as Europe is concerned, breeds in Finland, Mr. Wolley having been the first to discover its eggs and breeding-haunts. In Asia it doubtless nests in Northern Siberia, not far short of the latitude of the Arctic circle. From Mr. Wolley's interesting letters addressed to Mr. Hewitson I subjoin the following extract, taken from Mr. Dresser's 'Birds of Europe.' After referring to its cry, which, he says, has a local meaning, signifying *burnt wood*, Mr. Wolley remarks:—"Certain it is that this black bird not unfrequently lays its eggs in a part of the forest which has formerly been burnt; and here is one of its most unexpected singularities—a marsh-bird choosing the driest possible situation, even hills of considerable height. I have myself seen two nests so placed; and one of them at least was on ground which, from charred wood lying about, had evidently been burnt at some former period. They were nearly at the top of long hills, many hundred yards from marshy places, with good-sized firs on all sides The bird sits sometimes so close that one is tempted to try and catch it in the hand, its white back conspicuous as it crouches with its neck drawn in. It either gets up direct or runs a short way before it rises; and then it flies round with an occasional *tjeuty*, or stands upon the top of a neighbouring tree, showing the full length of its slender legs, neck, and bill. But it is not till it has young that all its powers of eloquence are fully brought into play: it then comes far to meet any intruder, floating over him with a clear cry that echoes through the forest, or that is heard over a great extent of marsh, or it stands very near one, bowing its head, opening its beak quite wide in the energy of its gesticulations." Mr. Meeves, in writing to Mr. Dresser, says that "the nest is merely a depression in a tussock which is overgrown with moss, lichens, and blueberry-plants; the inside of the nest is lined with leaves." The eggs are four in number, and are

of the usual pyriform shape, although they are not much compressed at the small end, and vary in colour from a fine olive-green to a brownish-olive hue. Those of the former type are marked with large rather even-edged blotches of sepia, mostly gathered round the large end, though not in the form of a zone; beneath them are the usual primary markings of clear bluish grey. Eggs of the browner types are similar in character, but the secondary or underlying markings are browner; all have small blots or specks mixed with the larger, which run generally in a longitudinal direction. In a fine series before me, collected by Mr. Dresser in Northern Europe, some measure 1.86 by 1.25 inch, others 1.85 by 1.23 and 1.82 by 1.23, which shows that there is little variation in their size.

TOTANUS CALIDRIS.

(THE COMMON REDSHANK.)

Scolopax calidris, Linn. Syst. Nat. i. p. 245 (1766).

Tringa gambetta, Gm. ed. Syst. Nat. i. p. 671 (1788).

Totanus calidris (Linn.), Bechst. Orn. Taschenb. ii. p. 284 (1803); Gould, B. of Eur. iv. pl. 310 (1837); Blyth, Cat. B. Mus. A. S. B. p. 266 (1849); Middendorff, Sibir. Reise, p. 215 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Irby, Ibis, 1861, p. 239; Schlegel, Mus. P.-B. *Scolopaces*, p. 65 (1864); Jerdon, B. of Ind. iii. p. 702 (1864); Legge, Ibis, 1866, p. 420; Layard, B. South Afr. no. 611 (1867); Blanford, Zool. Abyss. p. 483 (1870); Swinhoe, P. Z. S. 1871, p. 406; Holdsw. P. Z. S. 1872, p. 474; Gould, B. Gt. Brit. iv. pl. 54 (1873); Shelley, B. of Egypt, p. 255 (1872); Hume, Str. Feath. 1873, p. 248, et 1874, p. 279; Von Heuglin, Orn. N. Ost-Afr. ii. p. 1165 (1874); Salvadori, Uccelli di Born. p. 328 (1874); Irby, B. of Gibraltar, p. 166 (1875); Walden, Trans. Zool. Soc. ix. p. 234 (1875); Legge, Ibis, 1875, p. 402; Dresser, B. of Europe, pt. 39 (1875); Blanford, Zool. Persia, p. 285 (1876); Butler & Hume, Str. Feath. 1876, p. 18; Scully, *t. c.* p. 189; Armstrong, *t. c.* p. 348; Davidson & Oustalet, Ois. de la Chine, p. 464 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 464; Cripps, *ibid.* 1878, vii. p. 304; Hume, *ibid.* 1879 (List of Ind. B.), p. 113.

Gambetta calidris (Linn.), Bonap. Compt. Rend. xliii. p. 597 (1856).

Le Chevalier aux pieds rouges, Buffon; *Gambetta*, *Chevalier rayé*, Buffon; *Gambet Sand-piper*, *Striated Sandpiper*, Latham; *Tureluur*, Dutch; *Chalréta*, Portuguese; *Nastogjaschy-ulit*, Russian. *Chotabatan*, Hind. (Jerdon); *Mallee kotan*, Tamil.

Maha watuwa, Sinhalese.

Adult male and female (Ceylon). Length 11.0 to 11.5 inches; wing 6.0 to 6.45; tail 2.6 to 2.7; tarsus 1.9 to 2.05; bare tibia 0.8 to 1.0; middle toe and claw 1.3 to 1.35; bill to gape 1.85 to 2.02; expanse 1.95 to 2.0. "Weight 6 oz." (Hume).

Iris reddish or yellowish brown; bill black; upper mandible with the base as far as the nostril reddish, and nearly half the under mandible red (the amount of red variable); legs and feet orange-red, joints in some greyish.

Winter plumage. Head, hind neck, interscapular region, tertials, and wing-coverts glossy cinereous brown, the tertials with pale edges and dark indentations; lores brown, darkening just in front of the eye; above them a white streak, more or less lengthened into a supercilium; primaries and their coverts blackish brown; secondaries and their coverts paler brown at the base; the terminal third of the former and the tips of the latter, together with the inner webs and terminal portion of the shorter primaries, white; the coverts likewise have their outer edges indented with white, and a bar of the same next the tip; 1st primary-shaft white; centre tail-feathers brownish cinereous, indented with darker brown, remainder with the coverts white, barred with brown; chin, throat, breast, lower parts, back, and rump white; the under tail-coverts with dark mesial lines; lower part of face and sides of throat striated with brown; axillaries pure white; chest whitish, with the centres of the feathers brown, with darker mesial lines, which are generally continued down on the breast.

Summer plumage (Norway, June: British Museum). Wing 6.3 inches; tail 2.8; tarsus 1.8; middle toe 1.25; bill to gape 1.8.

Forehead, lores, and face blackish brown, striated with white; the throat and fore neck with more white, the edgings of the feathers being broader and gradually increasing on the chest and lower parts, which may be said to be white, boldly streaked with black everywhere, except on the abdomen; crown and hind neck blackish brown, the feathers on the former edged with rusty, the latter with greyish margins to the feathers; lower part of hind neck,

interseapulars, and scapulars glossy olive-brown, streaked and patched with blackish, taking the form of bars on the scapulars; many of the feathers with fulvous marginal spots; greater wing-coverts barred with white near the tips; upper tail-coverts and tail more barred than in winter.

An example from Northern Asia is darker than the above; the back and scapulars are greenish black, and the fulvous markings quite obscured. Wing 6·3 inches; tarsus 1·9; bill to gape 1·85. Specimens arrive in the Andamans in September in summer plumage.

Young chick (Orkneys). Bill to gape 0·7 inch; tarsus 1·0.

Head and wings rufous, streaked with black; down the forehead and through the lores a black streak; back buff, handsomely marked down the centre with black; sides mottled with the same; face and fore neck buff; chin and breast whitish.

In first plumage (June, Yarkand). "Bill black at the tip, dusky grey at base; irides very dark brown; legs and feet dull orange-fleshy." *Older bird*. "Bill black at tip, greenish slaty at the base; legs and feet greenish yellow, claws black" (*Scully*). Wing 5·9 inches in this stage.

On arriving in Ceylon birds of the year have the legs and feet yellowish red.

The brown portions of the upper plumage have the feathers dark-shafted and the edges *fulvous* white, with subterminal margins and interrupted bars of blackish brown; the wing-coverts are conspicuously marked in this manner, and the tertials have deep white indentations or interrupted bars; upper tail-coverts more closely barred than in the adult; the sides of the throat, fore neck, and chest with dark mesial stripes on a white ground, and the whole of the under surface and under tail-coverts with narrow drop-shaped marks of the same.

When a little older, as seen during the winter in Ceylon, the wing-coverts have conspicuous *whitish* edgings and dark indentations, and the dark mesial lines on the fore neck are plainer than in old birds. The amount of white on the wing-coverts varies much at this time; but the head, hind neck, and interseapular region are always uniform brown.

Obs. This species has the webs more developed than its congeners; that between the middle and inner toe is quite as deep as the outer web in the Marsh-Sandpiper (*T. stagnatilis*). It has been placed in a separate genus (*Gambetta*), and might well stand in it; but I prefer to keep it in *Totanus*. My measurements of Ceylon specimens do not quite equal those of individuals from other parts. Dr. Scully records *males* as—length 11·0 to 12·0 inches, wing 6·45 to 6·55; *females*—length 11·75 to 11·9 inches, wing 6·35 to 6·5. Dr. Armstrong finds that females are smaller—wing 5·8 to 6·1 inches, against 6·8 (?5·8) to 6·3 inches. This inferiority in size, however, is not constant; a male in my collection measures 6·1 inches, a female 6·4; and, in fact, I have usually found females the larger of the sexes.

Distribution.—The Redshank is an abundant cool-season migrant to Ceylon, and is more numerous, so far as I ascertained, on the east and north-east coasts than on the north-west. I met with it all over the Jaffna Peninsula, and at suitable places down the coast to Manaar. It was in goodly numbers at Illipekadua and in the Erinatavoc Islands; and on the great flats just to the north of the island of Manaar I also saw it. It is found at Puttalam; but south of Chilaw it occurs, according to my experience, rarely and in few places. The only spots I have personally met with it were the islands at the foot of the Negombo Lake and the Pantura lagoon. In the Trincomalee district, and thence north to Mullaittivu it is very common, and as numerous on the borders of the great salt lake of Nilāvele as anywhere in the island. It is found at the mouths of the rivers all down the east coast, and also about the leways or salt lagoons in the Yāla and Hambantota districts. I never met with it between Tangalla and Galle, nor to the north of the latter place; and I have not seen it away from salt or brackish water, it being almost entirely a littoral species. It does not quit the island until May, and arrives in September.

Jerdon states that it is found throughout the greater part of India in the cold season. It, however, appears to be rare inland. In the Deccan, for instance, we find it recorded as rare (*Davidson*); and the Rev. Dr. Fairbank does not mention it at all. Nor is it noticed as inhabiting the district lying between the Ganges and Godavari, or Chota Nagpur proper, although it must inhabit the estuaries of rivers flowing through that region. It is very common on the Hooghly and about Calcutta, being the most abundant species of its genus in the market there. In Furreedpore it is not common. In the north-west it is abundant, being freely diffused in suitable localities throughout Kattiawar, Gwjerat, Kutch, and Jodhpoor, but more partial to the

shore and the sides of large rivers than to inland waters. At the Sambhur Lake it is rare, but is recorded as returning as early as the 25th July. It remains in the Guzerat district until May, according to Capt. Butler. Eastward of the Bay it is abundant: it occurs in large quantities, writes Dr. Armstrong, between Elephant Point and China Bakcer, and along the margins of the nullahs and creeks in the vicinity. In Tenasserim it is "common throughout the province during the cool season, alike on the coast and in and on every little pool." In the Nicobars it has not been noticed; but in the Andamans it is found along the salt-water creeks, is quite common from September till May, and has been killed in June in winter plumage (*Hume*). It has been recorded from Singapore, and in Java it was obtained by Herr Kuhl and Van Hasselt. In Borneo it has been obtained in the south at Pagattan, Pontianak, and Sarawak. Forsten procured it in Celebes; and Lord Tweeddale includes it in his list of the birds of that island; but Dr. Meyer, during his recent explorations in that island, does not seem to have met with it. According to Swinhoe it winters in China, being generally distributed there; but I find no mention of its occurrence in Formosa, although he got it in Hainan. Père David speaks of it as common in the two seasons of passage. In the Philippines it has been obtained by Cuming. It does not appear to have been noticed in Japan; but on the south coast of the Sea of Okhotsk and in the Shantar Island Von Middendorff shot it in August. Sehrenek did not meet with it in Amurland, nor in the territory of Iakoutsk; nor does Mr. Seeböhm record it from the Yenesei. It is therefore evident that in Asia, as in Europe, it has not a high northerly summer range, being content to breed in lower latitudes than many of its relatives. Przevalsky writes of it as follows:—"Breeds sparingly in the Hoang-ho valley and about the shores of small rivers in South-east Mongolia, whither it migrates in the end of March, about which time it was also numerous at Koko-nor, and in August, during migration, about the rain-puddles in Gobi. We did not find it in the Ussuri country." In Yarkand Stolietzka noticed it during the first half of the winter, and Seilly obtained it as early as March in the same locality; he writes as follows:—"The first specimen of the Redshank was obtained at Kashgar in November, where it was tolerably common; and after that it was not met with until March; and in May and June this species swarmed everywhere near water in the vicinity of Yarkand. The bird was also found in the valley of the Karakash towards the end of August." In Turkestan it occurs on passage, according to Severtzoff, and breeds rarely in grassy steppes and in cultivated districts up to an altitude of 4000 feet. As regards Persia, Mr. Blanford writes:—"The Redshank probably breeds in the Persian highlands at the Lake of Shiraz and other places. De Filippi met with it in July near Sultaniah." In Baluchistan it was occasionally seen by him. Canon Tristram met with it in Palestine in the winter only; and in Asia Minor it is spoken of as being common on marshy ground, and observed until the 13th of May (*Danford*).

In Europe it is very abundant, and breeds in some countries, notably in Spain. Here Mr. Saunders found it common in the summer and nesting in marshes. Col. Irby states:—"I found the common Redshank in some numbers at the lakes of Ras Dowra towards the end of April; and they were then evidently beginning to nest. They were not in any thing like the quantity which breed in some parts of the marismas of the Guadalquivir. . . . In Andalusia this Redshank is, though frequently seen in winter, chiefly migratory, passing north in great abundance mostly towards the middle of April." In France, Germany, Holland, and England it is resident. In the Low countries Mr. Labouche says it is the most common Wader after the Lapwing. In many parts of England, but chiefly on the east coast, it is found in considerable numbers, but does not breed so plentifully now as in former days. In North Frisia Mr. Durnford found it breeding in numbers; and Naumann states that it is common on the shores of the Baltic. It migrates as far north as Finland, arriving there in May; but it does not appear to reach more easterly districts, if we are to judge by its absence from the Petchora, such a notable breeding-place of Waders. In a westerly direction, however, its range extends to Iceland, where it is even resident.

It winters in Morocco, leaving for the north in March and April, and returning in September, according to Favier. It is common in certain localities on the west coast (Senegambia, Ashantee, &c.); and Captain Shelley met with it in numbers at the mouths of rivers on the Gold Coast. It wanders as far south as the Cape, but is not so numerous in South Africa as others of the group. Layard remarks that it is found sparingly about the Knysna estuary and the mouth of the Salt River, near Cape Town; at a place called Zoetendals vley it was abundant in November. He also records it as having been shot by collectors at Lake Ngami.

On the eastern side Von Heuglin met with it frequently in Eastern Kordofan, on mountain-streams in Abyssinia, and on the Blue and White Nile, from September until March; and in the summer he found it in pairs on the Red Sea and in Nubia and Egypt. In the latter country he says that it is very abundant in the Nile delta, but rare above Cairo. It has been noticed in Algeria, but not by Mr. Gurney.

Habits.—This noisy and watchful Sandpiper is found in Ceylon on the muddy banks of river-estuaries, the edges of salt lagoons lined with trees and mangroves, which afford it shelter, on the foreshores of salt lakes, and particularly on salt-water creeks which run through alluvial land and unite with rivers near their mouths. It is of all the Waders which frequent the island the most wary on the watch, ready to fly away, and rises at the slightest appearance of danger. When alarmed, or when disturbed by hearing the approach of man, it utters its loud call, keeps still, and watches intently till it becomes aware of his proximity, when it is off in an instant, glancing along and beneath the bank, or close by the row of trees which covered it from view, with an arrow-like flight, swerving adroitly in its progress if it happens to pass near any one without having previously seen him; and when shot at and missed it generally swoops down in its flight and rises instantly again, darting round curves and corners with marvellous speed. It utters its note on the wing as well as at rest; and when a small flock are disturbed by being fired at they all give vent to their excitement in these loud calls, settling down only for an instant, rising again, darting back, and passing and repassing the place from which they have been driven until the intruder is out of reach. They wade up to the body while feeding, and walk hither and thither, picking up a morsel first on one side and then on the other, and holding themselves with much grace and elegance. It does not associate with other Waders, and is not sociable towards its own kind; it generally feeds singly; and if a small troop are found in the same locality, not more than two are usually together, the rest of the company being scattered along the bank at intervals of 10 to 40 yards. These little troops consist of from two to six or seven birds; and when they are disturbed they very often separate, and each one flies its own way. This Redshank may be always recognized on the wing by the large amount of white it shows on the back and wings, as well as by its loud note. Capt. Shelley says that this can be easily imitated, and by so doing the birds are called round within shot.

I have found its diet to consist of small shells, shell-fish, and aquatic insects. Mr. Dresser has noticed it picking up food on the beach when the surf was breaking on it, and avoiding the waves with apparent ease by running with great swiftness. Its favourite situation in Ceylon among those above mentioned is the tidal expanse to a salt lagoon, where the banks are high enough to conceal it, and above this a tolerable amount of mud left bare by the receding tide. In similar localities I always met with it in Essex, where the network of creeks threading the low land on the coast used to be frequented by scores of these birds. Mr. Cripps mentions the fact of one "hovering" over a small Cormorant (*Phalacrocorax pygmaeus*), which it was trying to annoy, which circumstance reveals a singular trait in its disposition. Col. Irby speaks of seeing a flock of thirty or forty, each one a little in the rear of the other, forming a sort of oblique line, and advancing across a shallow pool, all with their heads immersed in the water, and moving them from right to left with great rapidity. An abundance of food had here caused these birds to unite in a flock, contrary to their habit.

Nidification.—The majority of Indian and Ceylonese winter birds probably breed in Turkestan and Kashgaria, though many may go further north. Von Heuglin gives 71° as the limit of their Arctic journey; but they evidently do not nest far north in such numbers as other Sandpipers. It is an early breeder both in Asia and Europe. Dr. Scully says of it in Yarkand:—"This species breeds from April to June. On the 22nd April three of its eggs were obtained, which seem very large for the bird; they measure 1·8 by 1·23, 1·78 by 1·22, and 1·76 by 1·21 inch. In shape they are moderately broad ovals, a good deal compressed and lengthened out at one end. They have a very faint gloss. The ground-colour is grey stone, with spots, a few streaks, and numerous blotches of blackish brown and sepia scattered pretty evenly over the whole surface of the egg, except at the point, where the spots occur only sparingly."

In 1865-66 I had ample opportunity of observing the nidification of this species on the marshes on the coast of Essex. I found them breeding as early as the first week in April and until the middle of May in pasture-land covered with coarse rye-grass in company with the Common Pewit. The nests were one and all placed in the middle of tufts of grass, some of which were so small that it was difficult to comprehend how

the birds could conceal themselves in the middle of them. The centre of the tuft was beaten down, and a little cavity thus made with no other lining than the green standing grass on which the eggs, two, three, and four, were deposited, and not placed with the small ends together, owing probably to the birds disturbing the position of the eggs on leaving them without being able to readjust them. The end of the blades of grass thus trampled down were arranged round the sides of the space thus formed, and constituted the walls of the nest. There were no entrances to these nests, or, rather, "forms," although there were little tracks in the surrounding grass, showing where the bird approached and left her eggs; but they ceased at the edge of the tuft, and the ways of egress and ingress were carefully closed up. Nothing could be more admirably concealed than these eggs, for above them the tops of the grass-blades were brought together, so that they were entirely hidden from view. They varied but little in colour and marking, being all of a rich ochre ground-colour, beautifully blotched and spotted with rich reddish brown.

When disturbed the Redshanks flew right away from the ground and settled in the surrounding creeks; but the Pewits flew round and round their nesting-ground in their accustomed manner.

A further series which I have examined, in the collection of Mr. Dresser, and taken in Northern Europe, are stone-yellow and olivaceous yellow in ground-colour, marked in some cases with large blotches of dark sepia intermixed with smaller spots overlying specks of bluish grey. Others are without the larger markings at the obtuse end, and are more thickly covered with small blots. Some measure 1.78 by 1.13 inch, others 1.77 by 1.23 and 1.65 by 1.14. They are moderately compressed at the small end and rounded at the large.

TOTANUS GLAREOLA.

(THE WOOD-SANDPIPER.)

Tringa glareola, Linn. Syst. Nat. i. p. 250 (1766).

Totanus glareola (L.), Temm. Man. p. 421 (1815); Gould, B. of Europe, pl. 315 (1837); Middendorff, Sibir. Reise, ii. p. 215 (1853); Schrenck, Reisen u. Forsch. Amur-L. i. p. 416 (1860); Schl. Mus. P.-B. *Scolopaces*, p. 71 (1864); Layard, B. of S. Afr. no. 614 (1867); Swinhoe, P. Z. S. 1871, p. 406; Shelley, B. of Egypt, p. 259 (1872); Gould, B. of Gt. Brit. iv. pl. 57 (1873); Salvadori, Uccelli di Born. p. 327 (1874); Hancock, B. of North. p. 121 (1874); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1163 (1874); Hume, Str. Feath. 1874, p. 298; Irby, B. of Gibraltar, p. 167 (1875); Legge, Ibis, 1875, p. 276; Seebohm & Harvie Brown, Ibis, 1876, p. 291; Dresser, B. of Europe, pt. 57, 58 (1877); Blakiston & Pryer, Ibis, 1878, p. 220; Seebohm, Ibis, 1879, p. 152.

Totanus affinis, Horsf. Trans. Linn. Soc. xiii. p. 191 (1821); Gray & Hardw. Ill. Ind. Zool. pl. 51. fig. 2; Sclater, P. Z. S. 1873, p. 222.

Rhyacophilus glareola (Linn.), Kaup, Nat. Syst. p. 140 (1829); Walden, Trans. Zool. Soc. 1875, ix. p. 233; Hume, Str. Feath. 1878 (B. of Tenass.), p. 462, 1878, vii. p. 488, et 1879, pp. 70, 113 (List Ind. B.).

Tringa littorea, Pall. Zoogr. Rosso-As. p. 195 (1810).

Actitis glareola (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 697 (1864); Holdsw. P. Z. S. 1872, p. 474; Legge, J. A. S. (Ceylon Branch), 1873, p. 53; id. Ibis, 1874, p. 29; Butler & Hume, Str. Feath. 1876, p. 17; Armstrong, *t. c.* p. 344; Ball, *ibid.* 1878, vii. p. 228.

Shore-Sandpiper, Penn. Arct. Zool.; *Spotted Sandpiper* of some; *Sandpiper*, *Snippet*, Sportsmen in Ceylon; *Wald-Uferläufer*, German. *Kodidi*, Malay (Blyth); *Chupka*, Hind.; *Chinna-ulanka*, Telugu (Jerdon); *Junggit batang*, Borneo (Mottley); *Kotan*, Tamil.

Sili watuwa, Sinhalese.

Adult male and female (Ceylon). Length 8·4 to 8·7 inches; wing 4·8 to 5·0; tail 2·0; tarsus 1·4 to 1·6; middle toe and claw 1·25 to 1·3; bill to gape 1·15 to 1·3. This species varies much in bulk, length of bill, and tarsus, but not in wing.

Iris light or yellowish brown; bill blackish or deep black-green, with the base beneath round the nostrils greenish yellow; legs and feet yellowish olivaceous, the joints and toes darker; in some the tarsus has a prevailing greenish tint.

Winter plumage (Ceylon). Head, hind neck, upper back, wing-coverts, and tertials dark olive-brown, passing into blackish brown on the rump; the hind neck and head edged narrowly with greyish, the remaining parts with marginal whitish spots blending into the brown, and with interspaces of blackish brown; these spots are most pronounced on the longer scapulars and tertials; quills deep brown, 1st primary-shaft white; the secondaries and their greater coverts with white tips and terminal edges; centre tail-feathers brown, *closely barred* with dusky whitish; remainder white, barred with blackish brown, chiefly on the outer webs of the lateral feathers; upper tail-coverts white, the longer feathers *barred near the tip with blackish brown*; a dark stripe through the lores, supercilium, round the eye, cheeks, chin, throat, and under surface white, washed on the chest and striped on the cheeks with brown; the feathers of the chest likewise with brown striæ; lateral under tail-coverts barred

on the outer webs, and the centre feathers striped with brown; axillary plumes white, barred *distantly* with brown (in old birds the bars are almost obsolete); under wing-coverts white, scantily barred with brown. The coloration of the chest varies; scarcely any two specimens are alike; but in general the centre part is whitish, continued down from the throat.

Summer plumage (Amoy, May, ♀). Above darker than in winter, the feathers being brownish black on the head, back, scapulars, and wing-coverts, the head striated with white, owing to the clearly defined lateral white margins of the feathers; the marginal spots and bars on the scapulars and tertials with sharper edges than in winter; the stripes on the sides of the throat, face, and fore neck are dark brown; the chest-feathers have many cross bars of brown, and the flanks and sides of the breast are barred with blackish brown; under wing more closely barred than in winter. This example measures:—wing 5.0 inches; tail 2.2; tarsus 1.5; middle toe 1.1; bill to gape 1.35. It is a large bird. An April specimen from Amoy entirely corresponds with Ceylonese examples of that date, and measures:—wing 4.8 inches; tarsus 1.35; bill to gape 1.2.

Young, nestling in down (Petchora river). Ground-colour of upper surface and wings warm fulvous buff, patched down the centre of the hind neck and back with velvety black; crown entirely black, the colour running in a point down to the bill; a stripe of the same from the bill through the eye, widening behind it; upper part of eyelid black; a black band down the centre of the wing, a broad patch on the femur, and the down of the tibia of the same colour; beneath whitish, tinged with buff across the throat.

Bill at front 0.45 inch; tarsus 0.85; middle toe 0.91 (longer than the tarsus at this stage).

Birds of the year, in the plumage in which many arrive in Ceylon, have the upper surface more spotted than in adults, the edgings of the feathers being of a fulvous hue.

Obs. The measurements of Indian examples are as follows:—(Irrawaddy delta) ♂: length 9.15 inches; wing 4.8, expanse 14.75; tail 2.1; tarsus 1.5; bill from gape 1.45. ♀: length 8.3; wing 4.85; tail 2.0; tarsus 1.55; bill to gape 1.3. (*Armstrong*.) European examples correspond with Indian and Chinese birds.

Distribution.—This Sandpiper is extraordinarily abundant in Ceylon. It arrives before the Snipe, and when it is met with in the paddy-fields in September sportsmen begin to look out for their favourite birds. It makes its appearance in large numbers during the first few days in September; but in some seasons very many are found at their usual haunts in August, early in which, in 1876, I met with it at Pusella, on the road to Ratnapura, and found it in paddy-fields under the Karawita hills a week later. It is diffused throughout all the low country, being most numerous where there are large extents of paddy-fields or many tanks. On the forest-rivers it is rarely seen, its place being taken there in small numbers by the next species. As the country is more cultivated in the west and south of the island its numbers there exceed those in other parts. According to my experience it is not at all common in the hills, except where the valleys are cultivated with paddy. To this rule, however, the recently constructed lake at Nuwara Eliya forms an exception, as I saw numbers on its borders in January 1877; prior to the existence of this water, I believe it was quite unknown in the upper hills. Some few are occasionally seen about the Colombo lake; and in April 1876 a small number frequented this locality for the whole month. At the end of April, and during the first week in May, they collect in very large flocks and fly northward during the night; and one year on the 28th of April immense numbers passed over Colombo after dark, piping loudly.

It is abundant and widely spread throughout the Indian empire, arriving in the north-west (Guzerat), according to Captain Butler, as early as the 7th of August and departing about the 12th of May. Among other places in the interior we find it recorded as common in the Deccan; and from Ahmednagar the Rev. Dr. Fairbank notes it. It is found on all the rivers in Chota Nagpur; and Mr. Ball notices it from the Godaveri valley, while Mr. Hume cites it as occurring in Raipur. In the neighbourhood of Calcutta it is so extraordinarily abundant, that Mr. Hume estimates that there, must be nearly 15,000 sold during the season in the market of that city. Notwithstanding its numbers there, I find that Mr. Cripps does not record it from Furrcepore. In the plains of Guzerat it is common, and has been obtained by Capt. Butler in summer plumage at Mount Aboo on the 8th of May. It is rare, according to Mr. Hume, in Sindh and in portions of Jodhpoor; and in Kattiawar Major Hayes-Lloyd did not notice it. The next species is much more common.

in this region. Glancing eastward we find it common in Upper Pegu (Oates), and abundant in the Irrawaddy delta, where Dr. Armstrong procured it near Elephant Point. At Tonghoo Captain Wardlaw Ramsay obtained it; and according to Mr. Hume it is pretty common throughout the province of Tenasserim. It was obtained on the Pakehan in the extreme south. Further south, in the Malay peninsula, Mr. Hume notes it in his 'List' from Malacca, Pulo, Seban, and Nealys. In the Andamans it is not very common: it was found about Pt. Blair by Mr. Davison, but in the Nicobars he did not meet with it. At Acheen, North-west Sumatra, this gentleman obtained it on paddy-fields, but it was not numerous; at the opposite extremity of the island (Lamong) it has been recently procured by Mr. Everett. It appears to be generally distributed throughout Borneo. Governor Ussher procured it in Lumbidan and on Moara Island and Labuan, while in the south it is recorded from Pagattan, Baujermassing, and other places, as also from Sarawak on the west coast. Forster met with it in Amboyna and in Celebes; and in the latter island Meyer lately procured it at Menado and at Limbotto in *July*, which latter circumstance is very noteworthy. The specimen was probably immature and non-migratory for the season. In Java it is not uncommon, and was described under a new name, *T. affinis*, by Horsfield. It occurs in the Philippines, but has only been, as yet, obtained in Luzon.

As regards China, Swinhoe's remark concerning it is, "Hurries past in early autumn and returns late in spring." So that it would seem that the birds passing through there must winter further south, in Cochin China and Siam, perhaps, and in the Malay archipelago, though why the species does not lodge in China during the winter is incomprehensible. Père David says nothing about its wintering in the country, but remarks that it passes across China in great numbers, stopping often to breed in the south. In Japan it seems to be common: Whitely obtained it at Hakodadi, and Blakiston at Yezo.

Returning to the northern confines of India, we do not find Dr. Scully meeting with it at Yarkand; but in West Thibet Von Pelzeln procured it on the Gyagar Lake at an elevation of between 15,000 and 17,000 feet. Mr. Blanford ('Zool. of Persia,' p. 285) met with it in the winter months in Baluchistan, and records it from an elevation of 3000 feet near Bam in South-east Persia. In Turkestan, however, it is stated by Severtzoff to breed; and it is singular that it does not do so in Persia. I transcribe from Mr. Dresser's work a sketch of its distribution in Northern Asia:—"It is found throughout Siberia; and Kittlitz records it from Kamtchatka. Von Middendorff says that it arrived on the Boganida (lat. 70° N.) on the 29th May (O.S.), and breeds there commonly. On the 12th of May he observed it in marshy places on the west slope of the Stanowoi mountains, but did not observe it again until he reached Udskoj Ostrog, where, as also on the sea-coast and on the large Shantar Island, he met with it. Von Sehrenck met with it along the Amoor, though less numerous than the Greenshank; and Dr. G. Radde obtained specimens at the Tarei-uor and on the eastern slope of the Southern Apfelgebirge. Messrs. Dybowski and Parvex met with it during passage in Dauria." To this I would add that Mr. Seebohm remarks (Ibis, 1879, p. 152):—"Next to Temminck's Stint the Wood-Sandpiper was by far the commonest Wader in the valley of the Yenesay. I shot the first on the 6th June at the Koo-ray'-i-ka, but did not meet with it north of lat. 69°." In Western Siberia Finsch found it on the Schtschutschja river, and states that it was there the most common of the Waders. In Palestine Canon Tristram noticed it in winter.

It is common along the north coast of Africa in the winter. Though numerous in Egypt, Captain Shelley found its visits irregular; it appears to be abundant in some seasons and scarce at others. Some few are said to remain throughout the year. In Algeria Mr. Gurney found it plentiful at Laghouat; and in Morocco Col. Irby noticed it in numbers about the lakes of Ras Dowra and other swamps. According to Von Heuglin it wanders southwards through Abyssinia to Sennaar, Kordofan, and Bahr-el-Abiad, ranging along mountain brooks and into upland moors to 10,000 feet. Mr. Andersson found it common in Damara Land, South-west Africa, and especially records it from Ondonga and Objimbinque. Messrs. Ayres and E. L. Layard procured it in Natal; but the former gentleman only observed it in one locality in November 1865; he also obtained it at the Cape, and he records it on two occasions from Transvaal, procuring it there in January, February, and Mareh. On the west it has been obtained by Captain Shelley on the Gold Coast in February; and other naturalists have obtained it in Senegambia, Gaboon, and Benguela.

It is spread throughout Europe, wintering in the south, occurring on passage in the central portions, and summering in the north, where it extends to the shores of the Arctic ocean. Col. Irby has observed it frequently on passage in Mareh, April, and May in the vicinity of Gibraltar; and Mr. Saunders shot a female

incubating near Aranjuez on the 28th of May. Messrs. Danford and Harvie Brown observed it on passage in Transylvania; and in Great Britain it is only a spring and autumn migrant, though some few perhaps remain to breed, as Mr. Hancock took a nest in June 1853, at Prestwick Car, Northumberland. Mr. Dresser writes that it has only occurred as a straggler on the west coast of Scotland; but in Elginshire, according to Mr. More, it has bred. The young just fledged have been shot in Norfolk, from which it appears that it has bred as far south as that country. In Heligoland it occurs on passage, and in the month of May has been obtained there by Herr Gätke. Mr. Seebohm met with it on the Petchora as early as the 28th of May. It was common at Habariki, but was not seen north of Stanavoialachta. It is, however, abundant in Finland far north, and also in high latitudes in Norway. According to Mr. H. C. Müller it has occurred on the Faroe Islands.

Habits.—The Wood-Sandpiper is more essentially a freshwater bird than any of its allies, except perhaps the next species. In Ceylon, to a considerable extent, it restricts itself to frequenting paddy-fields, the margins of lakes, tanks, and pools, flooded grass-land, and wet but bare marshes. When it first arrives the land is in course of cultivation, and it congregates in hundreds in the slushy ploughed fields, picking up insects, and running about over the newly harrowed soil, totally regardless of the shouts of the natives to their working buffaloes. When the fields are too wet for it to feed in it takes to the bunds surrounding the squares of tilled land, and stands motionless in little rows, allowing the sportsman to approach quite close to it, uttering its loud piping whistle as it rises, and flying round and round, till it selects another spot to light upon. Its tame disposition makes it a desirable quarry for the native hunter; and numbers are shot and brought in as “Shuāpe” to the market, where they, however, do not command the same price as the real article (Snipe), which the Cingalese invariably styles *Kaswatuwa*.

On the north-west coast about Jaffna, and likewise in the south-eastern district, it may be met with near tidal flats, on salt marshes near the margins of brackish backwaters, and on the edges of salt pans; but it is not to be found in such large flocks in any of these situations as in the paddy-fields of the interior during autumn; and it is in the spring, when the corn is growing up, that it is mostly driven to frequent these various salt waters. Its chief companions about lagoons and estuaries are the noisy Marsh-Sandpiper and the Long-toed Stint, which are both fonder of grassy salt marshes than of bare tidal flats; and in the interior the latter species is not unfrequently found consorting with it. On the large brackish lagoons or “lakes” in the south-west it may be seen with the Common Sandpiper affecting the muddy mangrove-lined shores of these large sheets of water, these two birds being about the only “Waders” to be found in these ornithologically-barren localities. It is also partial to the vicinity of the coir-pits, in common with the last species, where it finds an abundance of food in the insects which frequent these spots. When well on the wing, after being disturbed, its flight is swift, but on getting up and flying from one spot to another it is rather sluggish in its movements. After circling round and round a field, proceeding with great speed, it suddenly darts down with half-closed wings, extending them when it nears the ground, and skimming along with outstretched legs, alights in some inviting place. Its food consists of aquatic insects, shrimps, worms, &c. I have never seen it alighting on trees or fences, though sometimes it will perch, after being flushed, on a slanting stake or low inclining post. In northern parts, however, it constantly perches on trees, a habit which, after all, is not abnormal, as other species do the same. Messrs. Seebohm and Harvie Brown, in their paper on the birds of the Petchora River, write as follows:—“They were frequenting the pools in the middle of the town (Ust Zylma), and were exceedingly tame, allowing us to approach within a few yards of them. They were very common at Babariki, and we shot specimens, which had perched on the tops of high dead larches, quite 70 feet from the ground.” In Borneo Mr. Mottley found it to be a freshwater bird, perching on the *batangs* (hence its name) or drift timber.

Nidification.—The Wood-Sandpiper breeds near water, nesting in grass or amongst heath. The nest is placed in a little hollow and lined with grass and bents. A nest taken by Mr. Hancock at the famous wild-fowl breeding-resort, Prestwick Car, was situated on the side of a dry hillock where grew some heath and grass in the midst of a swampy spot. The number of eggs laid is four. The eggs of this species are, on the whole, rather larger than those of the Green Sandpiper. They vary tolerably in ground-colour, but more so

in their markings; the former is pale greenish stone, brownish stone, and olive stone. As examples of opposite types, one egg is marked with large oblique blotches of rich sepia over faded spottings of bluish and reddish grey, mostly collected at the large end, where there are fine streaks of sepia; while the other is spotted throughout with small blots and specks of lighter sepia over numerous spots of bluish grey, and almost round the large end is a long streak or line of dark sepia-brown. In others the markings are intermediate in size and number, and are chiefly located at the obtuse end. The dimensions of some are—1.46 by 1.03, 1.43 by 1.0, 1.57 by 1.04 inch.

During the breeding-season this Sandpiper makes a peculiar sound while flying about over the spot where its nest is situated. Mr. Seebohm, who has heard this in Northern Siberia, is of opinion that it is vocal, and says it resembles somewhat the note of the Wood-Wren. Mr. Hancock, on the other hand, believes it to be made by the wings, in the same manner which he supposes the Snipe produces the drumming sound. He publishes some information concerning it in his catalogue of the birds of Northumberland and Durham, which I here give *verbatim*:—"The Wood-Sandpiper produces a sound perfectly comparable to the murmuring or neighing of the Snipe. I have twice had the opportunity of hearing the Wood-Sandpiper; once when I took its nest at Prestwick Car in June 1853, and again at Gosforth Lake on the 6th of May, 1857. On the first occasion I observed the bird for a long time flying in the air before the nest was found; and afterwards while watching it return, previous to shooting it. It kept at a considerable elevation, wheeling about and descending at intervals in wide circles, with outstretched, quivering wings, like a Snipe, and producing at the same time a similar tremulous note; but the motion of the wings was more rapid and the sound was shriller and more musical, amounting almost to a sort of whistle. This was repeated over and over again, and sometimes when the bird was at a great elevation. When I heard it at Gosforth it was precisely under the same circumstances; but I failed to detect its nest, though I have little doubt it was somewhere in the neighbourhood."

TOTANUS OCHROPUS.

(THE GREEN SANDPIPER.)

Tringa (ochropus) ochropus, Linn. Syst. Nat. i. p. 250 (1766).

Totanus ochropus (Linn.), Temm. Man. d'Orn. ii. p. 651 (1820); Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 162; Gould, B. of Eur. iv. pl. 315 (1837); Kelaart, Prodrum, Cat. p. 134 (1852); Middendorff, Sibir. Reise, ii. p. 215 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schrenck, Reisen u. Forsch. Amur-L. p. 416 (1860); Newton, P. Z. S. 1863, p. 529; Gould, B. of Gt. Brit. iv. pl. 56 (1873); Layard, B. of S. Afr. no. 612 (1867); Swinhoe, P. Z. S. 1871, p. 406; Shelley, B. of Egypt, p. 258 (1872); Hume, Str. Feath. 1873, p. 247; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1161 (1874); Irby, B. of Gibraltar, p. 167 (1875); Dresser, B. of Eur. pt. 53 (1876); Blanford, Zool. Persia, p. 285 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 462; Blakiston & Pryer, Ibis, 1878, p. 220; Seebohm, Ibis, 1879, p. 152; Hume, Str. Feath. 1879 (List B. of Ind.), p. 113.

Totanus leucurus, Gray, Ill. Ind. Zool. ii. pl. 51. fig. 1 (1833-4).

Actitis ochropus (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Holdsw. P. Z. S. 1872, p. 474; Beavan, Ibis, 1878, p. 399; Jerdon, B. of Ind. iii. p. 698 (1864); Butler, Str. Feath. 1876, p. 18; Ball, ibid. 1878, vii. p. 228; Cripps, *t. c.* p. 303.

Bécasseau ou *Cul-blanc*, Buffon; *Greenshank*, Kelaart; *Lavandera*, Spanish (Irby). *Nella ulanka*, Telugu (Jerdon); *Tita*, Sind (Blyth); *Yamghurchi*, *Zagharak*, Turkestan (Scully); *Krungi*, Amurland (Schrenck); *Kotan*, Tamils in Ceylon.

Watuwa, Sinhalese.

Adult male and female (Ceylon). Length 9·3 to 9·7 inches; wing 5·5 to 5·75; tail 2·3 to 2·6; tarsus 1·3 to 1·45; middle toe 1·0 to 1·1; bill to gape 1·45 to 1·6.

Iris hazel-brown; bill deep brown, greenish round the nostril and at base of lower mandible; legs and feet variable—olivaceous plumbeous, greenish olive tinged with slaty, bluish.

Winter plumage (Ceylon). Head, upper surface, wing-coverts, and tertials deep olive-brown, with a strong green lustre; back, scapulars, tertials, and wing-coverts with dark shafts, and a series of alternate marginal pale and dark spots (these spots are much smaller and more inconspicuous than in the last, and the pale spots are dusky grey, and not white); quills and primary-coverts dark brown, with an olive-green gloss; upper tail-coverts *pure white*; tail white, the entire feathers with the terminal half dark brown, crossed by three *narrow white* bars, increasing in size to the outermost, which is all white, with the exception of a subterminal spot on one or on both webs, but which is wanting in some; orbits and a short supercilium white; lores and round the gape brown, the cheeks striated with white; chin and gorge, with the breast and the lower parts, white, the under tail-coverts unspotted; fore neck and chest brownish, striated with white down the centre; axillaries and under wing-coverts dark brown, with very *narrow, oblique*, white bars.

Summer plumage (Santander, June 1876). Plumage darker above than in winter; feathers of the head with white edgings near the tips; the upper back and scapulars with marginal spots of white; striations of the face darker than in winter; fore neck streaked with blackish; flanks and axillaries very dark brown, as also the under wing. Wing of this specimen 5·7 inches.

An Abyssinian example (15th April) has the neck more thickly striated, and the tertials spotted with fulvous grey, which is the colour of the spottings on the scapulars and upper back.

Young, in down (Wernland, 3rd June, 1869). Above rufous-buff, marked on the occiput and down the back with broad patches of black; on the crown three stripes of black; a black patch on each side of the rump, and one on the wings; tail blackish; a black stripe through the tail and above the ears; beneath white.

Three weeks old? (Sweden). Back and wings feathered, rest downy; head fulvous, with a broad frontal streak, widening on the crown of the head, and a narrow line above the eye joining the black on the occiput, and a streak through the lores widening above the ears; hind neck with a dark patch; feathers of back and wing-coverts earth-brown, with fulvous marginal spots; quills blackish brown; down of throat and neck greyish white; underparts feathered, white, with dark bars on sides of breast; tail-feathers blackish, with white subterminal band. Bill 0.84 inch at front; tarsus 1.02; middle toe 1.02.

Obs. Examples with the outer tail-feathers wholly white are presumably old birds. In some specimens the terminal portion of the outer tail-feathers is entirely brown, in others tipped with white and crossed by a more or less complete narrow bar of the same. Dr. Scully's measurements of Kashgar examples (females) are:—Length 8.9 to 9.65 inches; wing 5.6 to 5.95; tail 2.4 to 2.6; tarsus 1.35 to 1.43; bill from gape 1.55 to 1.7; weight 2.2 to 3.3 oz. The legs in these varied from "plumbeous" to "slaty green." Kamptee and Behar specimens examined by myself vary in the wing from 5.4 to 5.6 inches, and measure in the bill to gape 1.45 inch. An Angola specimen has the wing 5.6 inches and the bill to gape 1.55.

I subjoin here a diagnosis of the characteristics of this and the last-described Sandpiper in winter plumage, for the information of field-naturalists.

Totanus glareola. Smaller: wing 4.8 to 5.0 inches. Conspicuously spotted above; longer tail-coverts barred with brown; centre tail-feathers barred with bands of brown and white of equal width; axillaries white, distantly barred with brown; under tail-coverts with cross marks of brown.

Totanus ochropus. Larger: wing 5.5 to 5.75 inches. Ground-colour of upper surface darker, with inconspicuous marginal spots; upper tail-coverts *pure white*; centre tail-feathers black, with narrow, distant, white bars; axillaries *black-brown*, with *narrow* white bars; under tail-coverts *pure white*.

Distribution.—The Green Sandpiper is not nearly so common as the last species; and I had been some years in Ceylon before I met with it at all. Its chief haunts are the sandy beds of rivers in the Northern and Eastern Provinces, on which it is found in pairs. I first procured it in the forest at the river flowing by the Rest-house of Palampootaar; and this was the only spot where I saw it in the Trincomalee district. I subsequently found it tolerably numerous on other rivers in the northern half of the island, and on the Deduru oya near Kurunegala it was quite common. In the Western Province the only place I identified it from its ubiquitous relation (the Wood-Sandpiper) was at Boraslasgamuwa tank. It is also found, I have been told, at Kotte and Kæsbawa. On the rivers of the south-east it is likewise met with. If searched for, it will be found on the rocky torrents of the Central Province; for I met with a pair on the Maha-Eliya river, on Horton Plains, at an elevation of more than 7000 feet, it being the only bird that I saw frequenting this mountain-stream. I am of opinion that the last species has been sometimes mistaken for it, as it has been said to be so common in Ceylon. I killed many scores of Wood-Sandpipers before I became acquainted with the note of the present bird, in the hopes of acquiring specimens of it; and after becoming familiar with its voice I could not pass it by unnoticed. I never once saw it in paddy-fields or on any salt marshes near tidal flats.

This species has not got such a wide range in the Old World as the last, as it does not seem to extend into the Philippine Islands nor the Malay Archipelago. In India it is scattered over the whole empire more or less, and is, according to Jerdon, almost more common than the Wood-Sandpiper. In the Deccan it is abundant in the cold season; and the Rev. Dr. Fairbank records it especially from Ahmednagar. From the Rajmehal hills, Manbhoom, Lohardugga, Singhbhum, and Orissa it is noticed by Mr. Ball, and he elsewhere says (Str. Feath. 1874) that it is to be found on all the rivers of this region (Chota Nagpur). Mr. Cripps records it as "rather common" in Furreedpore; and in the neighbourhood of Calcutta it is very abundant. Captain Beavan procured it at Barraekpore, Julpigoorie, and Umballah, and speaks of it as being very plentiful in Bengal. In the north-west it is equally well distributed. It is common throughout the Mount-Aboo and Guzerat region, which includes Kutch, Sindh, and Jodhpoor. About the Sambhur Lake Mr. Adam found it frequenting the edges of open wells; and in Kattiawar Major Hayes-Lloyd says it is common. It is the earliest Sandpiper to arrive, writes Captain Butler, in this district, his date being the 15th of July; and it does not leave until the 12th of May. Col. Irby found it remaining in Kumaon as late as July.

Turning eastward, we find Mr. Oates recording it as common in Pegu; but it was not observed in the Irrawaddy delta by Mr. Armstrong. In Tenasserim it is not common, and is only recorded by Mr. Hume from Amherst and Thatone. From the Andamans, Nicobars, and Malay Peninsula it is wanting, in all of which localities, as we have seen, the Wood-Sandpiper is found.

Swinhoe says that it is found throughout China and Formosa, and he specifies the Hoehow Marsh in Hainan as a place which it haunts in April; he obtained it at Takow, Peking, and Foochow. Père David remarks that it occurs in China at all seasons. In Japan Messrs. Blakiston and Pryer say that it is common at Yezo; and here it most likely summers. It inhabits the shores of the Sea of Okhotsk, and was shot by Von Middendorff at the mouth of the Amoor on the 5th of May; a day later it was procured in the same year far up the river, on its tributary the Selilka. Schrenck procured it on the 4th of the month in question in the Stanowoi Mountains; so that the time of arrival from the south to breed in these distant northerly regions (lat. 52° – 55°) must be the end of April. Mr. Seebohm shot the first example of the season (1877) on the 15th of June in the Yenesay valley as far north as the Arctic circle; and it was by no means common, he remarks, in that latitude: in August he found it abundant at Yenesaisk, further south (58° N. lat.). Col. Przevalsky says that it occurs throughout Mongolia, except the Ala-shan mountains, and arrives there about the middle of April, but does not stay to breed, although some may be seen in the Hoang-ho valley in July. In Kan-su it was observed once in September, but never in Koko-nor. It is common in spring in Ussuri after about the 20th of April, frequenting Lake Hanka, and leaving in August. It winters in Kashgar, as Dr. Stoliezka found it common there at that season; and of its location there we further learn from Dr. Sennly that it was "common near Kashgar during the first half of the winter, and was often seen at Yarkand near streams, pools, and swamps from March to August, ascending the hills to 13,000 feet in the latter month." Dr. Severtzoff writes that it occurs in winter in the district of the Thian-Shan mountains, in Turkestan, up to an altitude of 10,000 feet, and that it breeds in the same locality up to about 6000 feet. In Persia Mr. Blanford procured it at Shiraz, which has an elevation of 6000 feet above the sea; and he also notes it as being observed at 3500 feet in Baluchistan. In Palestine, where it winters, Canon Tristram saw it as late as June, long after all the Sandpipers had left. In the peninsula of Sinai it was obtained by Mr. Claude Wyatt in the winter; and Mr. Danford writes of it wintering in the ravines of Cydnus, in Asia Minor. In South-eastern Europe, though it does not breed there, it is found very late in the season, for Mr. G. C. Taylor observed it in July; and Mr. W. H. Simpson says that it remains in Greece until the breeding-season. It is a constant resident along the north of the Mediterranean, but in some places likewise remains into the summer months. In Malta it occurs on passage, but is sometimes also seen in June. At Gibraltar Col. Irby has seen it in every month except July; and he suggests that it may breed in Spain. It was obtained in Seville by Mr. Howard Saunders in January; and in Portugal it is rare, according to the Rev. A. Smith. In Macedonia it is said by Mr. Elvès to be the commonest Sandpiper which frequents the marshes there. In parts of Transylvania (Rea) it is abundant in autumn; and Herr Buda Ádám says that he has seen it in summer, but has not succeeded in ascertaining whether it breeds there or not. It is not so common in Great Britain as the Wood-Sandpiper, chiefly occurring on passage in the autumn; it occurs on both the Scottish coasts, and has been seen as a straggler in Ireland at all seasons. In France and Holland it is a migrant, as also in Southern Germany. It is a summer resident in North-east Germany, not breeding further west than Oldenburg. In Denmark generally it occurs as a migrant in spring and autumn; but some remain in Jutland in the summer. It arrives in Scandinavia in April and remains till September, being quite common in parts of the Dovrefeld, and breeding as far north as the Arctic circle. It is found rarely in Finland, and ranges in Northern Russia as far north as Archangel. Though found in the Ural range, it does not seem to breed there.

In North Africa it is rather plentiful. We have Col. Irby's authority for M. Favier's statement that it is not uncommon in the neighbourhood of Tangier, appearing in August and September from the north, and departing in February and March. Mr. Gurney found them numerous at Laghouat, in Algeria, in April; and in Egypt it is abundant and evenly distributed, according to Capt. Shelley. It arrives there, says Von Heuglin, in August and September, and then ascends the Nile; this naturalist procured it in Abyssinia and on the coast of the Red Sea, and met with it as far south as lat. 8° . On the western side of the continent it has been obtained in Gaboon; and Capt. Shelley found it plentiful at Cape Coast and Accra.

It is not uncommon in South Africa, inhabiting certain localities which are suited to its habits. Layard

writes :—"Several examples of this bird have been procured near Colesberg ; it is also common at Zoetendals Vley in November and at the Knysna." Captain Shelley likewise procured it at Durban ; and Mr. Barratt found it frequenting dams in the Leydenburg district. It is not included in Mr. Andersson's list of Damara-Land birds, nor has it yet been ascertained that it strays from the east coast across the Mozambique Channel to Madagasear. There is an example in the national collection from Angola ; and further north on the west coast it has been obtained in Gaboon. Von Heuglin records it doubtfully from the Canaries.

Habits.—This fine Sandpiper somewhat resembles the last species in its deportment and general habits, but is not so gregarious ; in fact it is for the most part found singly or in pairs, or three or four frequenting the same spot in scattered company. I have generally found it very shy and difficult to get within gunshot of, unless by stalking it ; and when doing this I have had experience of its very watchful nature, for it would take flight before I had any idea that my murderous intentions were discovered. On forest-rivers, however, I have come upon it standing beside the limpid pools, in their sandy beds, quite tame, allowing a near approach before rising with its loud cry ; it would then fly off, passing down the natural avenue of stately trees, and speedily realight, often returning, after being flushed again, by a circuitous flight to its first position. At the Horton Plains it was exceedingly wary, and I failed to procure a specimen. Its note is a much louder pipe than that of the Wood-Sandpiper, and it may be recognized from that species, especially on the wing, by the contrast of its white rump and much darker tail. Its flight is swift and vigorous, the intervals of rest characteristic of its aerial progress being composed of arrow-like glancings, which carry it on with great speed. Like its congeners it is sedate in its movements, not running like the Stints, but proceeding hither and thither, taking a few quick paces, and then stopping to pick up some insect, tiny snail, sand-fly, or earth-worm. Its flesh is excellent, which cannot be said of that of the Wood-Sandpiper, which is dry and flavourless.

Col. Irby writes of it, as observed in the Gibraltar district, that it is extremely irregular and uncertain in its movements, changing its ground continually. "They fluctuate," he remarks, "greatly in numbers ; days elapse without seeing a single bird, and suddenly several appear ; but they are seldom observed in any greater number than two or three together ; generally they are solitary in habits, and without exception frequent shores of freshwater lakes, ponds, and streams." Mr. Dresser remarks that Naumann has found in "its stomach, in April, a reddish larva about as thick as a knitting-needle, and numbers of a small thread-like white maggot intermixed with a greenish substance."

Nidification.—As this species breeds in Turkestan it may possibly do so in Cashmere, Kumaon, and other sub-Himalayan localities, where it has been observed far on into the season for nesting. Its eccentric habit of nesting in the deserted habitations of other birds (which has probably been acquired from the circumstance of its summer habitation at the time that it first came into existence having been subject to inundation) may have caused its nest to be overlooked in districts where it is found in breeding-time. This abnormal nidification was made known about a quarter of a century ago by a German writer, Herr Wiese, who gave an account of the Green Sandpiper's nesting in Pomerania in the 'Journal für Ornithologie,' 1855. His article was the subject of a notice by Professor Newton in the P. Z. S. 1863, p. 529, from which I extract the following particulars :—"In the 'Journal für Ornithologie' for 1855 Herr Wiese, writing on the ornithology of Pomerania, especially in the district of Cöslin, says that he had first heard from an old sportsman, who knew the peculiarities of all the forest-animals, that the *Totanus ochropus* nested in old Thrushes' nests, which information, he remarks, 'I naturally did not believe ;' but he states that some years after, in 1845, he obtained from the same man four fine eggs of a bird of this species, which for many years had been wont to nestle in an old beech tree. Still doubtful on the subject, the following spring he himself found a nest of the bird on a pine which had a fork about 25 or 30 feet high. 'Joyfully,' he says, 'I climbed the tree, and found in that fork four eggs on a simple bed of old moss.' In the spring of 1853 he again obtained four eggs of the same species ; and on the 25th of May, 1854, he found four others placed in the old nest of a Song-Thrush, out of which the shed buds of the beech had not so much as been removed."

In the 'Journal für Ornithologie,' 1862, Mr. Hintz, a Swedish forester, published an account of all the nests which he had taken, the first having been found by him as early as 1818. These were principally the old habitations of the Song-Thrush ; but some had been laid in those of the Pigeon and the Jay, one in that of

a Butcher-bird, and another in a hole in which a pair of Flycatchers had previously bred. One nest was in a fir, about 18 feet from the ground; but the usual height was from 3 to 6 feet, and all were close to the water's edge. Mr. H. W. Wheelwright, the "Old Bushman," has taken the nest not unfrequently in Sweden; and recently Mr. Seebohm found one on the Yenesay, in lat. 67° N., in a willow tree, about 6 feet from the ground, containing one egg.

The eggs are pale whitish green and pale brownish stone, some specimens between these two types having a slight olive tint in the ground-colour. The markings are *small*, and consist of specks and roundish blots of sepia-brown, mixed with short strokes or marks of the same, under which are light spots of purplish grey and bluish grey; the small end is nearly as much marked as the large. In size some are 1.57 by 1.1 inch, and others 1.52 by 1.14. The series before me is in the collection of Mr. Dresser, and was taken in Northern Europe.

Subgenus TRINGOIDES.

Bill with the groove extending quite to the tip. Legs rather short. Tail longer than in *Totanus*.

Of small size and almost solitary habit; and with scarcely any change of plumage in the summer.

TRINGOIDES HYPOLEUCUS.

(THE COMMON SANDPIPER.)

Tringa hypoleucos, Linn. Syst. Nat. i. p. 250 (1766).

Actitis hypoleucos (Linn.), Ill. Prod. Syst. Mam. et Av. p. 262 (1811); Gould, B. of Eur. iv. pl. 316 (1837); Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Schrenck, Reisen u. Forsch. Amur-L. p. 417 (1860); Schl. Mus. P.-B. *Scolopaces*, p. 80 (1864); Jerdon, B. of Ind. iii. p. 699 (1864); Gould, Handb. B. of Austr. ii. p. 263 (1865); Layard, B. of S. Africa, no. 616 (1867); Holdsw. P. Z. S. 1872, p. 474; Shelley, B. of Egypt, p. 258 (1872); Henderson & Hume, Lahore to Yarkand, p. 289 (1873); Gould, B. of Gt. Brit. iv. pl. 58 (1873); Legge, Ibis, 1874, p. 29; id. J. A. S. (Ceylon Br.) p. 53 (1874); Scully, Str. Feath. 1876, p. 188; Seebohm & Harvie Brown, Ibis, 1876, p. 292; Ball, Str. Feath. 1878, vii. p. 228.

Totanus hypoleucos (Linn.), Temm. Man. p. 424 (1815); Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 163; Kelaart, Prodromus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Irby, B. of Gibraltar, p. 168 (1875); Dresser, B. of Eur. pt. 61, 62 (1877).

Tringoides hypoleucos (Linn.), G. R. Gray, Gen. B. p. 88 (1841); Swinhoe, P. Z. S. 1871, p. 406; Salvadori, Ucc. di Born. p. 326 (1874); Von Heuglin, Orn. N.Ost-Afr. ii. p. 172 (1873); Hume, Str. Feath. 1874, p. 299; Walden, Trans. Z. S. 1875, ix. p. 234; Hume, Nests & Eggs, iii. p. 588 (1875); Armstrong, Str. Feath. 1876, p. 344; Hume, *t. c.* p. 465; Blanford, Zool. Persia, p. 285 (1876); Davison & Hume, Str. Feath. 1878 (B. of Tenass.), p. 463; Hume, *ibid.* 1879 (List B. of Ind.) p. 113; Blakiston & Pryer, Ibis, 1878, p. 220.

Actitis empusa, Gould, B. of Austr. vi. pl. 35 (1848).

Guinetta, Brisson; *Petite Alouette de mer*, Buffon; *The Common Longshank* (!), Kelaart; *The Summer Snipe* in England; *Sandpiper*, *Snippet*, Sportsmen in Ceylon; *Andarios*, Spanish (Irby). *Potti ulanka*, Telugu (Jerdon); *Tilla*, *Musda*, Sindh (Blyth); *Trinil batu*, Java; *Junggit-junggit*, Borneo (Mottley); *Kiboranto*, Madagascar (Newton); *Alouette*, Seychelles (Newton); *Krungi*, *tschitsche*, Amoor Land (Schrenck); *Kotan*, Ceylonese Tamils.

Watuwa, Sinhalese.

Adult male and female (Ceylon). Length 7·8 to 8·2 inches; wing 4·2 to 4·5, expanse 13·5; tail 2·25; tarsus 0·9 to 1·0; middle toe and claw 0·97 to 1·02; bill to gape 1·02 to 1·15.

Iris brown; bill deep brown or dark plumbeous, the base yellowish or pale beneath; tibia, knees, and feet dusky greenish; tarsi greenish grey, in some immature birds pale bluish.

Winter plumage (Ceylon). Upper surface, from head to tail, including the scapulars, tertials, and wing-coverts, olive-brown glossed with green, less on the head and hind neck than elsewhere; all the feathers with a dark brown shaft-stripe, broader on the upper back and scapulars than on the hind neck, and expanding on the interscapular region into a central patch; scapulars and tertials pencilled near the tips with black; wing-coverts and lower back with many cross marks of brown, some of the greater series with white tips; primaries and secondaries olive-brown, the former with the basal portion of the inner webs white, extending to the second quill, and in some only to the third; tips of the secondaries white; shaft of the 1st quill whitish near the tip; winglet and primary-coverts with white edges to the outermost feathers; central tail-feathers with a dark tip, remainder

pale brown, with deep white tips, a subterminal band of dark brown, and the outer webs barred with brown, the white predominating on the lateral feathers; a whitish supercilium extending forward to the bill; through the lores a brown stripe continued behind the eye; cheeks and sides of neck greyish brown, with dark central stripes; sides of the chest brownish; chin, fore neck and under surface, the upper part of throat, and from the centre of the chest to the under tail-coverts unmarked; the fore neck with narrow brown shaft-streaks; axillary plume and median under wing-coverts pure white; lesser under wing-coverts white, with dark bases.

Summer plumage. Male (Cardiganshire, June). Length 7·8 inches; wing 3·0, expanse 9·3; tail 2·3; tarsus 1·0; middle toe 0·82; bill to gape 1·1.

Bill olive-brown, tip blackish, lower mandible and gape pale olivaceous fleshy, tip dusky; legs and feet pale leaden grey, toes tinged with yellowish.

Head and upper surface a darker brown than in winter, and illumined with a more brilliant green lustre, equally strong on the wing-coverts and back; the interseapular region, scapulars, and tertials with wavy cross bars of brown; rump unmarked; upper tail-coverts crossed with brown; white portion of the inner web almost obsolete on the 2nd primary, and much smaller on the 3rd than the 4th; face, ear-coverts, and loreal stripe darker than in the above; stripes of the fore neck and chest bolder, and these parts washed with brownish; stripes also present on the chin.

Obs. The darker and more glossy summer dress is acquired, as in other Scolopacine birds, by a change of colour; but a partial moult takes place, as in other genera, in the spring. I have March examples killed in Ceylon with here and there a new feather. Schrenck, in writing of Amoor-river specimens, notices that the white patch on the inner webs of the primaries extends to the 2nd quill, while in European examples it terminates at the 3rd. There is doubtless a tendency to more of the white coloration in Asiatic birds than in European; but the latter frequently have the white patch on the 2nd quill in a greater or less degree, and yearling birds in Ceylon only have a small amount of white on that quill, so that, to a certain degree, it is a characteristic of age.

Young (nestling in down). Ashy grey, mottled with black on the back, and with a central stripe down the back; through the lores a black line, and another on the head.

Bird of the year (September, Ceylon). Bill blackish brown, base slaty; legs and feet slaty greenish, toes dusky. Brown of the head and back darker than in adults, and the head and hind neck with the shaft-stripes indistinct; the feathers of the back, scapulars, and wing-coverts with regular subterminal blackish-brown bars and buff-grey tips, the barring broadest on the scapulars and wing-coverts; upper tail-coverts marked in the same way, but not so boldly; the ground-colour of the lateral feathers wholly white, barred completely across with blackish brown; secondaries very deeply tipped with white, and the inner primaries narrowly tipped with the same; frontal feathers edged with whitish; fore neck less conspicuously striped with brown than in adults; towards the middle of the season (*January*) the whitish or buff tips wear off, and in the following *March* the immature plumage is chiefly noticeable on the wing-coverts. The yearling barred and tipped dress is not fully acquired until September, specimens shot in that month still having partly green tail-feathers.

Obs. There is considerable variation in the colour of the light tipping on the wing-coverts. In a large series of immature birds examined in the Swinhoe collection from China, I find that they are buff in some specimens and whitish in others. A dozen individuals in this series vary in the wing from 4·0 to 4·5 inches. Indian and Yarkand specimens fall within my Ceylonese limits of measurement.

Tringoides macularius, the Spotted Sandpiper, is the American representative of this species.

Distribution.—This elegant and widely-spread Sandpiper is very abundant in Ceylon, being diffused throughout all the low country, and an inhabitant of the borders of streams and rivers in the Central Provinces up to a general altitude of 3000 feet. Since, however, the Nuwara Lake has been formed, it finds its way to that elevated locality. On the Maha Eliya, at Horton Plains, I did not meet with it; but it may occasionally be found there. It is a winter visitant to Ceylon, arriving very early in August, and departing as late as the last week in May or beginning of June. At Colombo I have seen it during the first week in June, and at Kandelay tank on the 3rd of August, by the end of which month a good many used to be seen about Trincomalee. It would seem, therefore, that it can scarcely migrate to Northern Asia in so short a time; and I can hardly believe that some do not remain throughout the year in the island, though it

cannot be expected that they would breed there. It has never come under my notice in July; and during a tour I made through the tank-districts in that month I made particular search for it, but without success. As many breed in Cashmere, it may be assumed that it is to that region these birds, which are so short a time absent from the island, resort for the purpose of nesting. All round the coast, and even about the Colombo Lake and on the sea-shore near the town, this Sandpiper is common; and on the salt-lagoons of the west and south coasts it is invariably seen. It affects the rivers of this part of the island far inland; but not so much those which traverse the forests in the east and north of the island, although there is no saying where one will not meet with a pair in wandering through these jungle-wilds; and as to the shores of the large tanks, they are a favourite haunt. In the Central Province it is locally diffused, and at Nuwara Eliya was met with by Mr. Holdsworth in February.

In the Laccadive Islands it is very common, as Mr. Hume observed it on all the islands he visited. Throughout the Indian empire it is generally distributed; but Jerdon did not find it so common as the Wood-and Green Sandpipers; he found it usually about the shores of tidal rivers, canals, and on the pebbly banks of rivers. Far inland, in suitable localities, it can scarcely be less plentiful than in the maritime regions. In the Deccan it is said to be common; and Dr. Fairbank records it from Ahmednagar. It is found on all the rivers in Chota Nagpur, writes Mr. Ball; and he notes it from the valley of the Godavari. About Calcutta it does not seem to be so common as its above-mentioned allies; and from Furreedpore it is not recorded. Captain Beavan found it less plentiful in Lower Bengal than the Green Sandpiper. In Guzerat, writes Captain Bntler, it occurs round the edges of most of the tanks between Deesa and Ahmedabad; and his dates of its arrival and departure are the 4th of August and the 20th of May. In Sindh Mr. Hume occasionally met with it, and about Karachi and Hyderabad it is not uncommon. In the Sambhur-Lake district it is rare. Further north in Cashmere it is common in the breeding-season, and all along the base of the Himalayas it is to be met with. Mr. Brooks records it from Derali in the valley of the Bhagarati.

In Pegu it is said to be common; and Mr. Oates has met with it there in August. In the Irrawaddy delta it is not abundant (*Armstrong*); but in Tenasserim it is common everywhere, both inland and on the coast. It is abundant in the Andamans, not departing, according to Mr. Davison, before the middle of May, and returning again during the latter half of August. Mr. Hume's remark on it would well apply to Ceylon; he says, "From Preparis to Galatea Bay the Common Sandpiper was the *one* bird that, wander where one might along the coast, it was impossible to avoid seeing." In the Malay peninsula it is recorded from Kopah, Malacca, and Chopong; and at Singapore it is not uncommon; it has also been procured in the Nicobar Islands. It inhabits the entire eastern coast of the continent, summering in Japan between the months of April and August, and affecting all the rivers there, residing likewise in China throughout the year, inhabiting the islands of Hainan and Formosa, and extending eastwards to the Philippines, throughout which group it is evidently diffused, for recently the islands of Cebu, Luzon, Mindanao, and Camiguin have been added to its habitat by various naturalists. Further east still it has been obtained by Dr. Finckh at the Pelew Islands. It is spread entirely throughout the Malay archipelago, and, as time goes on, will probably be recorded from every island in that vast group. At present it is recorded from Sumatra (where Mr. Everett likewise recently procured it), Java, and Bangka; likewise from many parts of Borneo (where it was obtained in Sarawak in August) and from Labuan; also from Flores, Ceram, Timor, Amboina, and Celebes. In the latter island Dr. Meyer procured it recently at Limbotto in July, and in the adjacent Tongian Islands in August, from which it is to be inferred that immature birds remain there occasionally throughout the year. It has further been obtained in Halmahera, Morotai, Batchian, Waigiou, and New Guinea; from the latter island it has been recorded by several naturalists; and recently Mr. L. Stone met with it at Port Moresby. It is spread throughout the entire coast-line (as far as it has been explored) of the vast island-continent of Australia, extending to Tasmania. It has not been met with, according to Mr. Ramsay, anywhere in the interior.

From India northwards it wanders in the summer up to the Arctic circle, spreading eastwards to Kamtschatka, and westward to the northern limits of Europe. Between Kashmir and Yarkand, Dr. Henderson procured it on the Sujet Pass at an altitude of 17,000 feet; and Dr. Scully saw it on the banks of the Karakash, Sanju, and Arpalak rivers; but neither he nor Dr. Henderson met with it on the plains of Kasgharia. Severtzoff says that it breeds throughout Turkestan. According to Przevalsky, it breeds on the rivers of

S.E. Mongolia, and is common on the Hoang-ho, but does not occur in Ala-shan. In Kan-su and Halha he met with it on its autumnal migration, and found it very abundant in the Ussuri country. Middendorff met with it on the Stanowoi Mountains, North-eastern Siberia, nearly as high as the crest of the range, and obtained it in August on the south coast of the Sea of Okhotsk. Schrenck found it abundant on the Amoor river; and Maack procured it on the Schilka. It has been noticed on the shores of Kamtehatka; and Von Heuglin says it has been obtained at Krajak, south of Alaska. On the Yenesay Mr. Seeborn shot the first example of this species on the 12th of June, and "found it frequent on the banks of the river wherever he went."

Mr. Blanford met with it in Persia on the Elburz mountains at an elevation of 7000 feet, and in Baluchistan at Rampur.

My space prevents me doing more than glancing at its European distribution. It is a common bird throughout the continent, migrating, as I have above remarked, to the extreme north, and frequenting the southern portion in the winter. It arrives in England at the end of March, breeding in many counties as well as in Wales and Scotland, and departing again sometimes in September; but it has been obtained, writes Mr. Hume, as late as the 16th of November. At the Straits of Gibraltar, Col. Irby records it as arriving in October and November, and found it very abundant in April on passage north from Africa; some remain, he thinks, to breed, as he has seen them in May, in which month, likewise, Lord Lilford observed it in the Castilles. "It is the most common of the Sandpipers," according to Favier, in Morocco; and he has seen it on passage south as early as August. In Egypt Captain Shelley found it resident and evenly distributed throughout that country and Nubia. Von Heuglin says it is resident on the White and Blue Nile, in Abyssinia, in Kordofan, and on the Gulf of Aden, but less common in summer than at other seasons; he did not find its nest, but believes that it breeds in the country. It has been found round the whole African coasts to the extreme south, and is even recorded from the Sahara. It appears to be locally diffused, and perhaps not abundant, along the extensive coast-line, as I observe that Governor Ussher did not procure it on the Gold Coast, although it is recorded by Hartlaub from that region. It is scarce in the Transvaal, according to Mr. Ayres; in the Cape colony, according to Layard, it is likewise so; it was obtained on the Cape flats and near Cape Town, and he met with several at Zoetendals Vley. It is found in Madeira and throughout the Canary Islands; Mr. Godman says it nests in Teneriffe, but he does not record it from the Azores. It wanders eastward to Madagascar, where Mr. E. Newton found it common on the east coast in September and October. He writes that it inhabits Mauritius from September until April; and he met with it in the Seychelles, on the island of Mahé, in January.

In Southern Greenland it has been observed; but I am not aware that it has been detected anywhere on the east coast of America.

Habits.—One cannot but regard this most graceful Sandpiper with admiration, not only on account of the extreme elegance of its form and the vivacity of all its actions, but also owing to its wonderful ubiquity, and from the knowledge of the fact that its tiny form graces the sandy shores and coral reefs of distant continents and remote islands, as much as it does the banks of our hill-streams in cultivated England and the forest-bound shores of Ceylonese tanks. It generally associates in pairs, or in little scattered troops of three or four, and is usually a very tame bird. It may be seen running along the shores of the Colombo lake, close to the road on which scores of vehicles are hourly passing, or flying from rock to rock on the Galle Buek, uttering its clear shrill piping note, and often mounting up to the rampart of the bastion, where it will run to and fro for an instant, oscillating its elegant form with a regular up and down motion of the tail. It will then, perhaps, fly off to the rock which rises from the water a little distance from the shore; and as the long monsoon swell laves its surface and almost covers it at each passing wash, the little Sandpiper trips to and fro, avoiding the wave or fluttering up for an instant till it has passed over, when it will realight with its merry trill, as if defying the ocean's sway. Such is its habit all round the coast of Ceylon—at home alike on beach and rock, and ever restless, perpetually flying to and fro, and constantly uttering its pleasant whistle, both as it rises and while it runs about on *terra firma*. Should a pair be haunting the same spot, a little distance from one another, they answer each other, and often fly to meet one another, joining in a conjugal twittering as they alight. On the sandy beds of forest-rivers it delights to run round the little pools or along the insignificant stream which is all that is left of the broad torrent of the rainy season; and here it finds abundance of

flies, insects, and aquatic larvæ to feed upon. In the west and south of Ceylon a favourite haunt is a reeking bed of cocoanut-husks in process of decomposition for coir-manufacture, at the side of a brackish lagoon; it runs over this and catches the numerous flies attracted by the unpleasant odour of the coir.

It is fond of frequenting the same spot throughout the season, taking up its quarters where it first lodges on arrival, and remaining there till it migrates again. In May these birds collect in little troops before leaving the west coast of Ceylon, and are then very noisy and more restless than ever. Its usual note is a *treēt-treēt-treēt*, the first syllable being drawn out more than the others; but in the spring and during the breeding-season it keeps up a constant jingling or trilling note, uttered so quickly that when three or four birds are together a singular consonance of sound is produced. Its flight is peculiar, being a succession of little skims in the air, the result of several rapid strokes of the wings, succeeded by a little interval with the wings motionless.

A pair frequented the beach beneath the ramparts at Fort Frederick, Trincomalee; and I once witnessed them carrying on a singular performance, not during the breeding-time, but in the month of November. They strutted to and fro, with their tails spread out and inclined to the ground, now and then making a little run at each other, suddenly dropping the wings, after which they would retire; and becoming more excited after a little while, they commenced to dart forward to the attack with wings trailing on the ground, heads stretched up, and tails erected vertically over their backs, which final display terminated in a violent pecking at each other. There had evidently been some grave difference of opinion, and they had determined to have the matter settled by an appeal to arms!

Dr. Armstrong noticed it in the Irrawaddy delta, chiefly in ploughed fields, on cultivated land, and on the margins of jheels. It is the exception in Ceylon to find it in fields, as its place is entirely taken there by the equally ubiquitous Spotted Sandpiper. In Great Britain, where it breeds, it is found by the side of streams and round the borders of lakes and mountain-pools. It frequently perches on fences; but, unlike the other members of its family, who only practise this habit in the breeding-season, and chiefly in northern elms (where it was evidently first contracted), the present species does so constantly; and the fact of its having been seen in this position has more than once given rise to the report that Snipe have been seen in England perching on fences. It is, however, quite possible (it may be well here to remark) that Snipe *may* have been seen in England perched on elevated objects when excited during breeding-time, for we have evidence of their doing so in Northern Europe.

In Africa Von Heuglin has noticed it perching on ships' rigging, as well as on bushes overhanging streams. Col. Irby remarks that it is fond of places where much seaweed has been thrown up by the tide.

Nidification.—I have no evidence of the Common Sandpiper breeding in Ceylon; but it is *possible* that an occasional pair may nest in the upper hills, although I do not know that it has been seen there in July. In India it breeds during the month of May, nesting by the streams that run through the Cashmere valley, particularly the Sindh river. Captain Cock thus describes its nest:—"It is placed a few yards from the water in an open situation in stray localities amongst sage-bushes. It is usually on the ground in a slight depression, generally to the north of a low bush, and consists of a few little pieces of stick or a few fragments of dead leaves. It always contains four eggs, the pointed ends of which are placed together in the centre. The bird gets off the nest very slowly, as if it wished to attract attention to itself."

Last June I visited a nest situated near an upland lake in Wales, where a number of these birds were breeding. It was placed on the hill-side, about 10 yards from the edge of the water, and was constructed of dead pieces of the common rush, laid in a hollow in the moss and grass made by the bird beneath a tuft of rushes. The bottom of the nest was fully 3 inches thick, and the egg-cavity tolerably deep and about $2\frac{1}{2}$ inches in diameter. It had previously contained four eggs; but they were hatched off about the 3rd of June. The young, when pursued, take to the water and swim well. In the lake in question they have been seen to swim right out from the shore, and cross over an arm of it to the other side. Although the nests are usually situated a little away from the water, the eggs are sometimes laid in shingle near the water's edge. They are of the usual pointed or pyriform shape and are stone-buff in ground-colour; and the markings, writes Mr. Hume, are a rich red-brown, in some cases so intense that they are almost black, and consist of specks and spots more or less intermingled with and underlaid by spots and small clouds of reddish, or in other cases

pale inky purple; they sometimes are confluent round the larger end, and are never very large or bold. He gives the average of eggs found in India as 1.46 by 1.06 inch.

A fine series in the collection of Mr. Seebohm, from Europe, vary in colour from greyish buff to stone-white. Some are marked at the large end with large blotches of deep brownish red, the rest of the egg having small specks and marks of the same openly distributed over the surface, under which are numerous primary markings of bluish grey: others have no large blotches, but are openly spotted with brownish red and bluish grey; they have the appearance of pointed eggs of the Rallidæ, the ground-colour being exactly that of some of the eggs of that family. They vary in length from 1.38 to 1.53 inch, and in breadth from 1.0 to 1.1.

Genus MACHETES*.

Bill moderately long, flexible, slightly curved, the tip somewhat bent down; upper mandible channelled nearly to the tip, gape placed far forward; nostrils linear, near the base. Wings long, pointed, with the 1st quill the longest. Tail short. Legs moderately short. Tarsus exceeding the middle toe and claw, and protected with transverse scutes. Toes moderate; outer connected to the middle by a small web; hind toe small.

Male much larger than the female; neck furnished in the breeding-season with a handsome outspreading ruff, and the lores with small tubercles.

* The genera *Machetes*, *Tringa*, and *Calidris* (Sanderling) are placed by some authors in the subfamily Tringinae; the differences in the feet of each of them from those of the members of the group just dealt with are, however, merely generic.

MACHETES PUGNAX.

(THE RUFF.)

Tringa pugnax, Linn. Syst. Nat. i. p. 247 (1766); Middendorff, Sibir. Reise, ii. p. 218 (1853); Schlegel, Mus. P.-B. *Scolopaces*, p. 51 (1864); Legge, Ibis, 1878, p. 204 (first record from Ceylon).

Tringa equestris, Lath. Ind. Orn. ii. p. 730 (1790).

Totanus pugnax (Linn.), Nilss. Orn. Suec. ii. p. 71 (1817).

Machetes pugnax (Linn.), C. L. Brehm, Vög. Deutschl. p. 670 (1831); Gould, B. of Eur. iv. pl. 328 (1837); Shelley, B. of Egypt, p. 246 (1872); Gould, B. of Gt. Brit. iv. pl. 61 (1873); Durnford, Ibis, 1874, p. 399; Irby, B. of Gibraltar, p. 170 (1875); Seebohm & Harvie Brown, Ibis, 1876, p. 292; Blakiston & Pryer, Ibis, 1878, p. 221; Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; Dresser, B. of Eur. pts. 69, 70 (1878); Hume (List of Ind. B.), Str. Feath. 1879, p. 112; Seebohm, Ibis, 1879, p. 151.

Philomachus pugnax (Linn.), G. R. Gray, Gen. B. p. 89 (1841); Blyth, Cat. B. Mus. A. S. B. p. 270 (1849); Jerdon, B. of Ind. iii. p. 689 (1864); Layard, B. of S. Africa, no. 619 (1867); Hume, Str. Feath. 1873, p. 239; id. Lahore to Yarkand, p. 287 (1873); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1180 (1874); Butler & Hume, Str. Feath. 1876, p. 17.

Le Chevalier varié, Buffon, Hist. Nat. Ois. vii. p. 517; *Chevalier commun*, Buffon; *Greenwich Sandpiper*; *Equestrian Sandpiper*, Latham; *Combatiente*, Spanish (Saunders); *Kamphaan*, Dutch; *Kampf-Strandläufer*, German; *Bajnok Bibicz* ("Champion Plover"), Transylvania (Danford). *Geh wala*, Hind.; *Chonchili*, Sindh (Blyth); *Habib el tchibib* ("the friend of the Godwit"), Moorish.

Adult male. Length 12.0 to 13.0 inches; wing 7.2 to 7.4; tail 3.0 to 3.3; tarsus 1.7 to 2.1; middle toe 1.2 to 1.3; bill to gape 1.4 to 1.6. "Weight 6 oz." (Jerdon).

The above measurements are taken from a large series from Siberia, Holland, and Northern Russia. There is but little variation, except in the tarsus, in which a considerable difference in size is apparent. The average length of wing is 7.2 inches.

Iris dark brown; legs and feet dusky fleshy yellow; claws black; facial tubercles or warts yellowish.

Male in breeding-plumage (black variety, Yenesay valley, lat. 70½°, July). Throat, fore neck, chest, and upper breast black, glossed on the neck and ruff with a steel-blue and green lustre; the feathers at the upper part of the side of the neck are elongated and descend to the shoulders, forming a large ruff; forehead and face covered with minute warts; the crown, nape, hind neck, and interscapulars with the feathers mottled with purple-black, increasing on the back into conspicuous patches; the plumes below the nape slightly elongated and joining the ruff; scapulars rufous-buff, the feathers marked with longitudinal patches and terminal patches of black; wing-coverts light brown, pale-edged; the innermost greater coverts and elongated tertials concolorous with the scapulars; primaries brown, with white shafts; secondaries paler, tipped with white, and with the inner webs whitish; the tertials with a conspicuous terminal black patch; back olive-brown, the feathers slightly pale-edged; some of the upper tail-covert feathers rufous-yellow with black tips; tail brown, the four centre feathers tipped with black, and the central pair much mottled with rufous-yellow; the extremities of the feathers white; abdomen, vent, lower flanks, and under tail-coverts white; on each side of the breast there is an elongated tuft of feathers, which are black with white margins; axillaries and under wing white, marked along the edge with brown.

White variety (same locality and date). Head, throat, fore neck, ruff, and elongated nuchal feathers white; the throat,

head, and sides of the ruff tinged with buff, and speckled on the head and nape with black; chest and flank-plumes blue-black, some of the feathers partly white; abdomen, flanks, and under tail-coverts white; hind neck and scapulars creamy white, handsomely dappled with black, many of the feathers with a terminal patch of the same, tertials barred with black and rufous-buff; some of the innermost greater coverts buff, mottled with black; wings as in the last; back brown; tail brown, the outer feathers with black subterminal bars and indentations of buff; face much more feathered than in the last; under wing white.

The above examples furnish instances of the two extremes of coloration in this extraordinarily variable phase of plumage. Between these two every conceivable variety of plumage exists*. Light varieties are perhaps more common than black; the backs of these are mostly rufous-yellow or buff, more or less extensively marked with black. The following is the colouring of some of the ruffs, including the head and throat:—

- (a) Throat and ruff white; head and nape tawny yellow, mottled with black.
- (b) Throat, ruff, and head white, the former boldly barred with shining blue-black: head striped and the nape mottled with the same (scapulars the same, and the back barred with black and tawny).
- (c) Throat and ruff white; neck ferruginous; head and hind neck purple-black.
- (d) Head, neck, and ruff light ferruginous; throat white (under surface white, patched with black and tawny).
- (e) Head and nape rusty buff, mottled with black, paling on the throat and ruff into buff barred with black rusty-edged bands (back and scapulars rusty buff, handsomely marked with crescentic black bands).
- (f) Head, neck, throat, and ruff creamy white, with a black gorget, and the ruff-feathers with terminal spots of black; hind neck speckled with black.

Of the dark varieties the following may be instanced:—

- (a) Ruff and neck black; chin, head, and nape white, the latter with mottlings and shafts of black.
- (b) Head and nape green-black; throat, fore neck, and ruff black, with narrow wavy bars of white (breast, interscapulars, and scapulars coal-black).
- (c) Head and nape black, with many ferruginous cross lines; throat, neck, and ruff rich rusty buff, barred with black.

Adult female. Wing 5·8 to 6·3 inches; tail 2·4 to 2·6; tarsus 1·5 to 1·6; bill to gape 1·25 to 1·4.

(Valley of the Petchora, June.) *No ruff*; head, hind neck, back, and wings brown; the head and centres of the hind-neck feathers very dark, with pale edges; wing-covert feathers likewise pale-edged; scapulars black, tipped with whitish, and margined laterally with dusky buff; quills and primary-coverts dark brown; secondaries tipped with white; lateral upper tail-coverts white, the centre feathers blackish brown, barred with rufous and white; tail brown, the lateral feathers mottled with black and tawny yellow on the outer webs; chin whitish; fore neck whitish brown, washed with rufescent, many of the feathers with two black subterminal spots; underparts dusky white, greyish on the chest and flanks, with a few blackish rufous-margined feathers at the sides of the chest.

Females vary a good deal in summer plumage. A July specimen from the Yenesay has the upper surface, rump, scapulars, and wing-coverts chiefly black, the hind-neck feathers margined with rufous-grey, and scapulars, upper tail-coverts, and wing-coverts handsomely marked with crescentic bars of rufous; chin and throat buff; fore-neck feathers black, with rufous-grey tips. Another from the Lower Petchora has the head fulvous, striped with black; the hind neck, scapulars, tertials, and wing-coverts black, with clearly defined edges of rufous-buff, recalling somewhat the markings of a Snipe; throat white; fore neck brownish fulvous, the feathers being brownish grey, tipped with fulvous.

Adult male (winter). Wants the ruff and facial warts; chin white; fore neck greyish brown; upper surface brown, the feathers centred with blackish, and the scapulars often handsomely marked with black and edged with rufous; interscapular region with triangular dark marks; central tail-feathers edged with rufous; the fore neck, chest, and flanks generally with dark bars, edged with rufous-buff.

Young, nestling. Above greyish buff; a broad black stripe down the back, with a white mesial line, and on each side a broad band of white; head with a diamond-shaped black mark, divided by a central stripe; a dark stripe through the lores and ear-coverts and passing round the nape; nape brown, with a dark bar across the hind neck, and two lateral ones continued along the side of the body to the rump, where they widen, forming, with the aforesaid

* Montagu, in his interesting account of a visit to a fowler in the fen-districts, says (Orn. Dict. p. 443), "We were shown into a room where there were about seven dozen males and a dozen females; and of the former there were not two alike."

central one, three dark longitudinal bands; beneath whitish; thighs mottled with brown. Bill at front 0.66 inch; tarsus 1.13.

Young, just fledged. Breast and flanks tinged strongly with fulvous; the head still in down: brown, mottled with buff; feathers of the back and scapulars blackish brown, with broad buff margins on all but the interseapular region, where the edgings are narrow and rufous; wings brown, greater coverts broadly tipped with white; secondaries the same; lesser wing-coverts tipped with dull buff.

1st autumn (male). Wing 7.1 inches. Throat and under surface white; sides and front of neck, breast, and chest uniform tawny grey, blending into the white; head brown, the feathers edged with rufous; hind neck brownish grey, lower part with the interseapulars and scapulars black-brown, with buff edgings to the feathers; tertials margined with rufous; wing-coverts broadly margined with buff, the tips being white; tail dark brown, with buff indentations at the outer edges. In an older male specimen shot in February at Kirinde, Ceylon, the wing-coverts are only edged with fulvous; the wing measures 7.2 inches, tail 2.7, tarsus 1.9, bill at front 1.4.

Obs. The Ruff in winter plumage, in which dress it will alone be found in Ceylon, might perhaps be mistaken for the Large-billed Stint (*Tringa crassirostris*) by those who are not well versed in this family of birds; but it may be distinguished always by the somewhat *curved* bill and peculiarly forward position of the gape. *T. crassirostris*, which is about the same size, has a straighter and longer bill and shorter legs; it will be found noticed in my article on *Tringa subarquata*.

Distribution.—For the introduction of this interesting and well-known bird into the present work my readers are indebted to my friend Capt. Wade-Dalton, 73rd Regt., who met with the only specimen yet recorded from the island at the Bundala Lake near Kirinde in February 1877. It is not unlikely that, being a bird of wandering disposition and extensive southerly range in the breeding-season, it may now and then visit Ceylon, and will no doubt be procured on future occasions within its limits. The south-east coast of the island constitutes by far the most southerly Asiatic point which the Ruff has yet reached in winter.

It is a bird of wide European, African, and Asiatic distribution, but, singularly enough, does not extend to China or the islands to the south-east of that Empire.

Jerdon states that it is found "in large numbers in India during the cold season;" but I imagine it is rare in the south. This author does not state any locality; and recent observers, with the exception of Mr. Davidson, have not seen it in the peninsula. He procured a "specimen from a small flock which arrived at Pundharpur in September 1877, and saw another large flock towards the end of that month." Its visits so far south are evidently uncertain, although it may now and then be found in considerable force. Again, towards the east it seems to be local. Messrs. Ball, Blanford, and Cripps do not make mention of it; but Mr. Hume writes that it is rather common about Calcutta, large numbers being brought to the market at the close of the season. Blyth likewise speaks of specimens with growing ruffs being shot at Rajmehal. In the north-west, where it first arrives from Western Asia, it is abundant in the autumn, winter, and spring; but, according to Mr. Hume, is less common in the two latter seasons than elsewhere. It is plentiful in marshes between Ahmedabad and Deesa, writes Capt. Butler, and appears as early as the end of July. Mr. Hume learns that at the close of the inundation in Sindh large flocks appear, disappearing in about a month. He met with it at the Kunkrowlee tank in Oodeypore. Mr. Adam says that it visits the Sambhur Lake in large flocks during the cold weather. Col. Irby met great numbers in Oudh and Kumaon. Eastward of the Bay of Bengal it is a mere straggler, not having been, as yet, recorded from Pegu or Burmah, and only having been once met with in Tenasserim at the mouth of the Sittang river.

It breeds, without doubt, in Kashgharia, as Dr. Henderson states that it was very common near the city of Yarkand, many specimens being obtained in August and September, when the males had lost their ruffs, but not all breeding-plumage. Dr. Scully does not seem to have noticed it in this region, so that perhaps it is not a regular breeder there. At the Panir Lakes, westward of Yarkand, Dr. Stoliczka met with it in April before the ice had broken up. In Turkestan, according to Severtzoff, it occurs on passage throughout the country up to an altitude of 4000 feet or thereabouts; but Przevalsky does not seem to have met with it in any of his travels in the Mongolian region.

It extends in the summer as far north as Kamchatka. In North-eastern Siberia Von Middendorff met

with it on the Taimyr river in lat. 73°, and on the 27th May saw them in great numbers on the Boganida, where they had come to breed. Schrenck does not record it from the Amoor. In Japan it is rare, but one specimen being spoken of by Messrs. Blakiston and Pryer as having been obtained in Yezo. In the Yenisey valley Mr. Seebohm found it common; he shot the "first on migration on the 9th of June on the Arctic circle," and afterwards met with them, as far north as he travelled, in the swamps on the tundra. Dr. Finckh saw it with young on the lakes which dot the low marshy ground on the borders of the Kara Bay. It has been procured in Arabia; Mr. C. Wyatt shot a few about Tor, in the district of Sinai, and Antinori found the young in Asia Minor, near Ephesus, in the month of July. It is found in winter, and on passage in the spring, in the islands of the Mediterranean—Cyprus, Crete, Sicily, Malta, and Sardinia. It leaves Italy for the north at the end of April; but in Andalusia Col. Irby has noticed it as late as the last week in May. In Southern Spain it is common in autumn, writes Mr. Saunders. In Southern Russia and Turkey it occurs on passage. Mr. Durnford found it breeding in North Frisia; and thence northward to Finmark and Lapland is its ordinary breeding-ground, although it occurs in Heligoland only in spring and autumn. Messrs. Seebohm and Harvie Brown met with it at Ust Zylma as early as the 30th of May, and found its eggs at Habariki on the Petchora on the 12th June; further north at Alexievka, at the mouth of the river, they saw flocks on the 9th of July. The Ruff used to be a common bird in the fens of Lincolnshire, where it bred in great numbers; but drainage has driven it almost out of the county, and in some localities it is never seen in the present day. Mr. Hancock found it breeding at Prestwick Car; but this locality has been long since drained. Some still breed in Norfolk; and it is also found on the east coast of Scotland (*Dresser*).

Turning southwards to Africa we find Mons. Favier recording it as a bird of passage in Tangier, crossing to Europe in March, and returning in August and September. In Algeria it also occurs on passage. Further east, according to Captain Shelley, "the Ruff is very abundant throughout Egypt and Nubia from August until May, more especially in the Fayoom and the Delta, where it may generally be met with in large flocks, frequenting the flooded fields in preference to the marshes." According to Von Heugliu it is to be found in some part or other of North-east Africa throughout the year. In autumn, winter, and spring it is very common in Nubia, Sennaar, Takah, and East Kordofan, and ascends into the Abyssinian highlands to an elevation of 10,000 feet; and in July and August he shot it at the Bitter lakes near Suez in full summer dress. In West Africa it has been obtained in Senegambia and Benguela; and further south it is found in winter in Damara Land, as regards which country Mr. Andersson writes:—"This bird generally appears in Damara Land with the return of the rainy season, when it is not uncommon, and leaves again before the ruff of the male bird is put forth; but I have reason to believe that it is to be met with in the Lake-regions during the intervening period. It is chiefly found inland, and but rarely on the coast." In Cape colony Layard records it from Colcsberg, the Knysna, and Traka, and he himself obtained it on the Cape flats. Further north, in Natal, it was procured by Ayres.

Turning, now, towards the northern hemisphere again we find that it has been met with in Iceland; and Professor Baird states, in the 'Birds of North America,' that it has been frequently killed in Long Island. That it strays, however, into the Neotropical region is much more remarkable; for we have evidence as to its having been obtained in South America on Von Pelzeln's testimony, who states, in 'The Ibis,' 1875, that he inspected a skin submitted to him by an eminent taxidermist in Vienna, Herr Hodök, and which was collected by Herr Münzberg in Guiana. I have communicated with Herr von Pelzeln on this matter, and he kindly informs me that there is no doubt that Herr Münzberg did procure the specimen in question somewhere in the territory between the Orinoco and the Upper Rio Negro, as the collection in which it was, and which was made in that region, was forwarded to him by Herr Rohrdorff, who lived in Venezuela. It is certainly one of the most remarkable instances known of the isolated occurrence of a species so far beyond its normal habitat.

Habits.—During the winter season the Ruff frequents damp land, marshes, flooded fields, &c. In Egypt Captain Shelley noticed that they affected the last-named locality in preference to marshes. They, however, locate themselves in India round the edges of wheels and tanks, and are also found on brooks, streams, and rivers. Ruffs and Reeves consort together in large closely packed troops, and do not appear to associate with

other Waders. Von Heuglin observes that they often fly about at some distance from their feeding-grounds, dashing about with a rapid Starling-like flight. Their food consists of insects, snails, worms, &c.; and they likewise eat grain, feeding, according to Jerdon, greedily on rice. The Ruff is noted for the boldness of its disposition and the tremendous pugnacity of its nature during the breeding-season; and it is during this time that its habits are so interesting, and have always furnished so much material for the pen of the naturalist. Its innate boldness is displayed from its earliest youth. The late Mr. H. Durnford writes as follows on his observations of it in North Frisia:—"We observed some noble battles amongst the Ruffs, who, unless fighting, stand bolt upright, like Owls. When engaged in combat they stoop and charge like Gamecocks. The Reeves are silent except when they have young; and then they will fly slowly round one, with a low guttural note. On Föhr we observed one which, from its anxiety, betrayed the fact of its having young. We retired behind the sea-wall, glasses in hand; and after waiting a few minutes, three young ones ran out from the grass, and then a fourth. Leaving my brother to watch, I jumped up and ran to catch them. They all scuttled away; and I could only secure one, the others escaping in the long grass. However, we again retired to watch, behind the bank, and had not been there half a minute before they ran out again and began to feed with their mother. I merely mention this incident to show their bold and fearless nature."

Mr. Dresser writes as follows touching the Ruff's habits:—"Its flight, when not encumbered with the ruff, is tolerably swift and direct; but the ruff appears to be a considerable hindrance; and it is always careful to avoid getting the wind behind these feathers, for it is then scarcely able to steer itself. Its note is low, and is seldom heard except during passage, and consists of tones like the syllables *kack, kack, kick, kack*. Unlike most of the Waders, it is a very tough and hardy bird, and will often get away with a good deal of shot in it; and when wounded and caught alive it will frequently recover and thrive well. When caught it soon becomes reconciled to captivity, and almost at first feeds greedily.

"When the breeding-season commences the males collect (or '*hill*,' as it is called) and fight, probably for the possession of the females; but though their actions are fierce, and they appear to contend with great ardour, they seldom harm one another. They are polygamous; but, as a rule, it would seem that a male shows greater preference for, and attaches himself more especially to, one favourite female."

Large numbers of these birds used to be caught in the Lincolnshire fens and fattened for table. They were captured by fowlers, who lived an obscure life in out-of-the-way places on the fens, and who sold them to feeders, some of whom were noted for their cleverness in fattening them for the tables of the rich. Montagu gives a long account, in his '*Ornithological Dictionary*,' of the manner in which the Ruff was taken, alluding to some of the most celebrated feeders who were in the trade in his time. I extract the following from his notes:—"The manner of taking these birds is somewhat different in the two seasons. In the spring the Ruffs *hill*, as it is termed; that is, they assemble upon a rising spot of ground contiguous to where the Reeves propose to deposit their eggs; there they take their stand at a small distance from each other, and contend for the females, after the nature of polygamous birds. This hill, or place of resort for love and battle, is sought for by the fowler, who, from habit, discovers it by the birds having trodden the turf somewhat bare, though not in a circle (as usually described).

"When a hill has been discovered the fowler repairs to the spot before the break of day, spreads his net, places his decoy-birds, and takes his stand at the distance of about 140 yards or more, according to the shyness of the birds.

"The net is what is termed a single clap-net, about 17 feet in length and 6 feet wide, with a pole at each end. This, by means of uprights fixed in the ground, and each furnished with a pulley, is easily pulled over the birds within reach, and rarely fails taking all within its grasp; but in order to give the pull the greatest velocity the net is (if circumstances will permit) placed so as to fold over with the wind; however, there are some fowlers who prefer pulling it against the wind as for Plovers. As the Ruffs feed chiefly by night, they repair to their frequented hill at the dawn of day nearly all at the same time; and the fowler makes his first pull according to circumstances, takes out his birds, and prepares for the stragglers who traverse the fens, and who have no adopted hill; these are caught singly, being enticed by the stuffed birds."

Captured birds were sometimes used as decoy-birds; but usually the fowlers had recourse to very rudely stuffed skins, some of which, writes Montagu, were managed "so as to be movable by means of a long string, so that a jerk represents a jump (a motion very common amongst Ruffs, who at the sight of a wanderer flying

by will leap or flirt a yard off the ground), by that means inducing those on the wing to come and alight by him."

Nidification.—The Ruff, as far as Asia is concerned, breeds almost entirely in the far north. It is one of the species which does not nidificate in Turkestan, and perhaps does not do so regularly in Kashgharia. It has been known to lay as early as the first week in May; but the usual time is during the first half of June. Von Middendorff took the first eggs on the Boganida, North-east Siberia, on the 15th of June; and on the 12th Mr. Seebohm got his first lot near the Arctic circle, on the Petchora, in Russia. In lower latitudes the time is earlier. Mr. Durnford met with young on one of the North-Frisian islands at the beginning of June. The nest is placed on a little hillock in a marsh on a large tuft of coarse grass, or on "a stump in the most swampy places surrounded by coarse grass" (*Montagu*). The grass in which the nest is situated composes the material for the nest. The number of eggs laid is four; they are pointed ovals and vary in ground-colour. The prevailing colour is pale olivaceous, some being inclined to stone-colour and others to a greyish tint. They vary much in marking, and also in shape, though they are in character pyriform. Some are marked all over the large end with very large smeary clouds of rich dark sepia mingled with underlying *dark* bluish-grey washes, accompanied, at the small end, by a few small blots. In others all the large blotches are confined to the large end, where they are close together, but not confluent, while over the rest of the egg are small blots and specks of black-brown very sparingly distributed. In one egg the entire markings almost consist of the primary or underlying bluish-grey colouring in different shades. The dimensions of some in a series before me are 1.83 by 1.32 inch, 1.79 by 1.25, 1.76 by 1.14, and 1.74 by 1.18.

Genus TRINGA.

Bill slender, flexible, moderately long, or not shorter than the head, usually straight, in some slightly curved; upper mandible channelled at the sides, the tip pointed and depressed; nostrils lateral and elongated. Wings long and pointed; the 1st quill the longest. Tail short, even or cuneate. Tarsus moderate, slender, scutellate in front. Toes divided to the base; hind toe and claw small.

Sternum expanding posteriorly, the outer notch wide and deep, the inner small and narrow. Mostly of small size; of gregarious habit; with a marked breeding-plumage.

TRINGA SUBARQUATA.

(THE CURLEW STINT.)

Scolopax subarquata, Gldenst. Nov. Comm. Petrop. xix. p. 471 (1775).

“*Numenius subarquata* (Gld.),” Bechst. Orn. Taschenb. p. 276, pl. 21 (1803).

Tringa subarquata, Temm. Man. ii. p. 609 (1820); Horsf. Trans. Linn. Soc. xiii. p. 193 (1821); Gould, B. of Eur. iv. pl. 328 (1837); Blyth, Cat. B. Mus. A. S. B. p. 269 (1849); Layard & Kelaart, Prodromus, Cat. App. p. 61 (1853); Middendorff, Sibir. Reise, ii. p. 220 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schrenck, Reisen u. Forsch. Amur-Lande, p. 421 (1860); Jerdon, B. of Ind. iii. p. 689 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 31 (1864); Layard, B. of S. Africa, no. 621 (1867); Holdsw. P. Z. S. 1872, p. 474; Shelley, B. of Egypt, p. 254 (1872); Hume & Henderson, Lahore to Yarkand, p. 288 (1873); Hume, Str. Feath. 1873, p. 242, et 1874, p. 297; Adam, *t. c.* p. 339; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1193 (1874); Irby, B. of Gibraltar, p. 172 (1875); Legge, Ibis, 1875, p. 402; Blanford, Zool. Persia, p. 284 (1876); Scully, Str. Feath. 1876, p. 187; Armstrong, *t. c.* p. 342; Cockburn, *t. c.* p. 510; David & Oustalet, Ois. de la Chine, p. 472 (1877); Dresser, B. of Eur. pt. 67, 68 (1878); Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; id. *ibid.* 1879 (List of Ind. B.), p. 113; Seebohm, Ibis, 1879, p. 150.

Schaeniclus subarquatus (Gld.), Gould, B. Austr. vi. pl. 32 (1848).

Ancylocheilus subarquatus (Gld.), Gould, Handb. B. Austr. ii. p. 256 (1865).

Pelidna subarquata (Gld.), Salvadori, Ucc. di Born. p. 322 (1874).

Alouette de mer, Buffon; *Cape Curlew*, *Red Sandpiper*, *Pygmy Curlew*, Latham; *bogenschnbliger Schlammlufer*, German; *Krasnogradka*, Russian, N.E. Siberia (Middendorff); *Niutscha*, Amoor Land (Schrenck); *Sandpiper*, *Snippet*, Sportsmen in Ceylon; *Curlew Sandpiper* of some. *Yamghurchi*, *Kugnak*, Turkestan (Scully); *Kotan*, Ceylonese Tamils. *Watuwa*, *Oliya*, Sinhalese.

Adult male and female (Ceylon). Length 8.0 to 8.6 inches; wing 5.05 to 5.2, expanse 15.8 to 16.2; tail 1.8 to 2.1; tarsus 1.15 to 1.3; middle toe and claw 0.9 to 1.05; bill to gape (straight) 1.45 to 1.62.

Note. The bill is slightly curved throughout in this species; it varies considerably in length, and somewhat in the amount of curvature.

Iris brown; bill black or deep green-black; legs and feet blackish leaden.

Winter plumage (Ceylon). Above with the wing-coverts and tail light cinereous brown, darkening on the rump and above the ulna, the feathers with dark shafts and edged narrowly with whitish, chiefly on the hind neck and median wing-coverts, and least so on the back and lesser coverts; quills and their coverts darkish brown, paler on the inner webs; the inner primaries broadly edged at the centre, and the secondaries and their coverts tipped with white; shafts of the 1st quill white, except at the base, the next two white near the tips; rectrices edged with the same; a dark band through the lores, in general blackish at the eye; supercilium, orbits, lower part of face, chin, throat, and all beneath upper tail-coverts and under wing-coverts white; sides of head and neck striped with brownish; the chest overlaid with a grey wash, and the feathers striped with brown. In some examples the upper tail-coverts do not seem to lose the blackish bars and stripes peculiar to the summer dress.

Summer plumage (Yenesay valley, lat. 66½°). *Male.* Wing 5.1 inches; tail 2.2; tarsus 1.2; middle toe and claw 0.95; bill to gape 1.5.

Fore neck and its sides, chest, breast, and flanks uniform glossy chestnut-red; all round the base of the bill and on the

face and lores dappled with whitish; sides of the chest scantily spotted with blackish; tips of the feathers above the abdomen whitish; vent and under tail-coverts white, most of the covert-feathers crossed with two black bars, and washed near the tip with light rufous; hind neck and interscapulars chestnut-red, the centres of the mantle-feathers glossy black, those of the hind neck with narrow blackish centres; top of the head nearly all black, the feathers merely margined with rufous; scapulars black, handsomely indented and edged with bright rufous and tipped with white; wings darker brown than in winter, some of the greater coverts patched with rufous, and the larger tertials, which are black, edged with it; centre of the lower back blackish brown, the feathers edged with whitish; the sides of the rump white; upper tail-coverts white, boldly barred with black; tail darker brown than in winter, the centre feathers edged with white, with a dark inner border; under wing white, as in winter.

The specimen here described is in remarkably beautiful plumage, and was procured by Mr. Seebohm at Koo-ray'-i-ka, in the Arctic circle.

Obs. This plumage is acquired in a very gradual manner, commencing in Ceylon as early as the end of February; the dark mesial lines on the interscapular region and scapulars become black, and expand by degrees over the feather; the chest-stripes are similarly affected, and the breast-feathers acquire a light brown bar across the middle, and at the same time the upper tail-coverts become dark-centred; a month later rufous edgings appear on the upper plumage, and large lateral spots of the same on the scapulars, and the portion of the feathers *anterior* to the dark bars changes into rufescent.

A partial moult of the body-plumage takes place while this change of feather is going on; but the new feathers also undergo a change of colour after appearing, thus assuming the complete nuptial character. The primaries, as in all other members of this family which I have examined whilst in a state of change to summer plumage, are not moulted at this season; they are changed in these birds but once a year, and that immediately after nesting, when, by a supreme effort of nature, they are all moulted at the same time, and the bird is ready for its long journey south at an early period in the autumn. Instances occur, however, and notably in connexion with this very species, in which individuals which are known only to breed in the north have been obtained in southern latitudes in breeding-plumage so early in the autumn that they must either have left their breeding-grounds prior to moulting to winter dress, or, lingering behind, have never reached them on their northern journey.

Young. The nestling plumage of this species has not, that I am aware of, been described.

An example in partial first-autumn plumage was obtained by me near Chilaw in October. The back-feathers are dark brown with fulvous edgings, and the scapulars have dark subedgings and rufescent-grey margins; the tail-feathers are the same, but the upper tail-coverts are pure white; the lower back-feathers are darker brown than in the adult, and the wing-coverts are conspicuously margined with pale greyish; throat fulvous white; lores and ear-coverts brown. The slaty-brown feathers of the first winter-livery are appearing among those here described.

The Dunlin (*T. alpina*), which somewhat resembles this species in size, but cannot be mistaken for it, has not yet been detected in Ceylon, although it is common in India in the cold season. The bill is slightly curved at the tip only, and measures 1.2 inch at front. In winter it is grey-brown above, with the rump, upper tail-coverts, and central tail-feathers brownish black; the chest is streaked with brown. In summer plumage the scapulars and interscapulars are bright rufous, centred with black, the feathers margined with rufous; the fore neck and chest striated with blackish brown, and the breast coal-black. Wing 4.4 to 4.6 inches; tarsus 0.9 to 1.05.

The large Stint (*T. crassirostris*) will perhaps some day occur in Ceylon, as it is found in India, Java, and Australia. Mr. Hume gives the wing as varying from 7.1 to 7.3 inches, tarsus 1.4 to 1.55, bill at front 1.6 to 1.85. It is ashy grey above, with the throat striated with brown and the breast spotted with brown, and is the *Schoeniclus magnus* of Gould's 'Birds of Australia.'

Distribution.—The Curlew Stint is a very abundant species in Ceylon, arriving, for the most part, at the end of September and beginning of October, during which latter month its numbers increase considerably. It is very plentiful in the north and on the north-west coast down to Puttalam, and equally so in the Trincomalee district and all places on the east coast where there is an abundance of ooze and tidal foreshore. In the south-east of the island it is very numerous; and this is the only part of Ceylon where I have found numbers of barren individuals during the breeding-season. In June and July 1873 it was quite common about the leways near Hambantota: these were evidently birds which had been bred the year before; and it may be a characteristic of this species that numbers of second-year birds do not breed. It is noteworthy that one specimen which I shot on the 28th of June, and which was engaged in a display of conjugal manners when I came upon it, presented interesting signs of an effort of nature to assume the breeding-dress. The feathers of the inter-

scapular region were black-centred, likewise the upper tail-coverts and the fore neck; and there were dark cross pencillings on the breast; but not a sign of rufous anywhere, showing that the bird had made an advance towards a change and then stopped.

I have found it on the islands of the Negombo Lake; and it is occasionally seen, I believe, about Panadure and at the mouth of the Kaluganga; but it is only a straggler to this part of Ceylon. It restricts itself entirely to the vicinity of salt-water, as far as my observations tend to prove, for I have never seen it far inland. Some individuals do not leave the island until May, in which month examples evidently about to migrate have been procured in breeding-plumage by Mr. Holdsworth.

The Curlew Sandpiper possesses a vast range, and in this respect scarcely yields the palm to the Dunlin, for though it does not extend over so much of the American continent, it migrates far south into Australia, which the latter does not. In India it is mostly a sea-coast bird, not being found, as a rule, in the interior, except on passage or in the case of non-breeding birds, an instance of which latter occurring in the Deccan is given by Messrs. Davidson and Wender, who obtained two or three at Sholapore in *June* 1874. It is common about Calcutta, being, according to Mr. Hume, more numerous there than the Dunlin. In Burmah it does not seem to be common, and has not been noticed, so far as I can ascertain, anywhere of late years but at the mouth of the Rangoon river, where Dr. Armstrong met with it. In Tenasserim it occurs along the whole sea-board, but is nowhere plentiful. It is likewise found, says Mr. Davison, in small flocks round the coasts of the Andaman Islands, and he saw it also at Great Nicobar. Individuals have been shot in this group in June and July in winter plumage, testifying further to the number of non-breeding birds of this species which remain throughout the year in the tropics.

It is found in the interior of Bengal on passage; and a pair were shot recently on the 17th of May at Allahabad by Mr. Cockburn. It is said to be common in Bengal by Jerdon; but Mr. Hume is of opinion that the Dunlin has been mistaken for it, although I must say it is difficult to see how any species could be confounded with the Curlew Stint, for in its large size and curved bill it is essentially different from any one of the small Stints inhabiting India. On the Sambhur Lake it is found in small numbers in the cold season, and has been obtained on the 21st May in full breeding-plumage by Mr. Adam. Its frequenting this place, 400 miles inland, in the cold season may perhaps be explained by the fact that the lake is salt, which causes birds passing it in autumn to remain throughout the summer. The same writer affirms that he shot specimens in full breeding-plumage in the first week in August at this same locality; and this extraordinary circumstance may perhaps be explained on the assumption that they returned before moulting from their breeding-grounds, or, as remarked above, that they lingered on migration, having acquired their nuptial plumage too late to reach the north. On the Sindh and Mekran coast Mr. Hume found it pretty abundant; and Major Hayes-Lloyd observed it in numbers on the shores of the Gulf of Kutch.

Dr. Henderson found it common in the marshes near Yarkand in August; and Dr. Scully procured it in October at the same place, telling us also (on native authority, I conclude) that it breeds in Eastern Turkestan. Severtzoff mentions, however, that it occurs only on passage in the north-eastern, south-eastern, and north-western divisions of the country, and is not found above an elevation of 4000 feet. In Persia Mr. Blanford did not meet with it; but it is found, according to Pallas, in spring on the Caspian. It probably migrates down the valley of the Ob to its mouth; but the Stint seen by Finsch on the Yalmal Peninsula, to the eastward of Obdorsk, and recorded by him ('Ibis,' 1877, p. 61) as this species, now turns out to be the Dunlin. In the valley of the Yenesay Mr. Seeböhm met with it at Koo-ray'-i-ka, on the Arctic circle, but saw nothing more of it; and he concludes that it bred nearer the sea than he was able to get. Further north Von Middendorff observed it arrive on the Taimyr river, in lat. 74°, on the 4th of June, and mentions that it dispersed at once over the tundras for breeding. On the Boganida river it arrived earlier, being seen there on the 27th of May. In Amoor Land it was only met with once by Sehrenck, who obtained a young bird on the Ussuri river. It is not recorded from Japan; but on the Chinese coast it is a bird of passage, and was procured in May by Swinhoe, in partial summer dress, both at Amoy and Formosa. Przevalsky states that a few birds were seen by him in the Hoang-ho valley in summer; and in the Ussuri country one was seen by him at Lake Hanka. Père David also met with it in Mongolia in summer plumage, and it was seen in great numbers on passage on the coasts of China. It extends through the Malay archipelago, but does not take in the Philippines in its passage. It has been obtained at Singapore and in Java, but not in Sumatra; and in

Borneo it has been shot in the province of Sarawak by Doria and Beccari, and at Pontianak by Diard. On the south coast of New Guinea it has been met with; and Mr. Ramsay records it from Port Essington, the Gulf of Carpentaria, and Cape York. It likewise visits the entire coast of the island-continent of Australia, and has occurred in Tasmania. Gould obtained it on Rottnest Island in Western Australia, and also at Port Macquarie, New South Wales. Some examples have been shot in this region in summer plumage, and these are, perhaps, the birds which occur so late in India in this dress; Gould says that the change takes place at the opposite season to that in which it occurs in Europe; he does not, however, state the month, and the specimens referred to may have been killed in March.

On the eastern shores of the Mediterranean it does not seem to be common. Canon Tristram records it from Palestine in winter, and Lord Lilford procured it in Corfu. In South-eastern Russia and on the Volga and Kama rivers it is met with on passage; but it goes very far north (as in Siberia) to breed. It was procured on only one occasion by Messrs. Seeborn and Harvie Brown at Dvoinik. It visits Lapland and Scandinavia in the summer, and is found in North Germany on passage. Mr. Durnford met with it in the North-Frisian Islands on the 30th of May, but found that it had disappeared by the 7th of June. It is chiefly an autumn visitant to the east coast of England. It is stated to have bred in Scotland; but Mr. Hancock thinks the eggs of the Dunlin have been mistaken for those of this species. It is not uncommon in spring in Transylvania, and has been obtained there in breeding-plumage. The same is the case in Southern Spain, says Mr. Saunders, where it is chiefly observed on passage in the spring. Col. Irby has seen it in great numbers in Andalusia at the end of April, and found it in good breeding-plumage by the 20th of that month. Lord Lilford also obtained it in summer dress in May on the Guadalquivir; and Mr. Dresser saw quantities in the market at Barcelona. It is stated by Mr. A. Brooke to be common during the winter in Sardinia. In Tangier it is an April and September migrant; it is recorded from Algeria, and likewise from Egypt, where it is rare, according to Capt. Shelley, who mentions the occurrence of two specimens only. Von Heuglin says it occurs in autumn, winter, and spring on the banks of the Nile and its tributaries southwards to Kordofan, Sennaar, and Habesch. It is more common, however, he says on the coasts of the Red Sea and Persian Gulf, and is met with in summer at Sauakin and Massowah. It extends down the east coast to the Cape, and has been procured at Zanzibar and Mozambique, and also in Madagascar. It has been obtained in Natal; and Ayres recently met with it in the Transvaal in the month of February. Layard says that it is abundant along the shores in the winter, and great flocks affect Robben Island and the mouth of the Salt River. He likewise remarks that he met with it in great numbers at a place called Fagy on the east coast, within $1\frac{1}{2}$ degree of the line. Andersson records it from Walvich Bay in Damara Land; and it has been obtained in every district along the west coast which has been ornithologically examined. I find it recorded from Benguela, Gaboon, the Gold Coast, Bissao, and Gambia. In the island of Madeira it was observed by Mr. Vernon Harcourt.

In Iceland it has been found, according to Von Heuglin, and in America it occurs as a straggler. Dr. Brewer informs Mr. Dresser that about twenty individuals have been from time to time captured, nearly all in the vicinity of New York.

Habits.—This fine Stint, though it is fond of frequenting sand banks, ooze, and foreshore left bare by the tide, is frequently found on salt marshes near the lagoons and estuaries on which it has taken up its winter abode; and I have seen a little flock on dry rising ground a few hundred yards away from the water's edge. It associates in Ceylon with *Tringa minuta* and *T. subminuta*; but when found in such company is generally single or in a small troop of three or four. When collected in little flocks of six to two dozen or more it is almost always unaccompanied by other species, and feeds gregariously in close company, the whole walking nimbly about as they pick up their food. It does not run about as much as its smaller relatives, feeding more after the manner of a Sandpiper than a Stint. At Jaffna in March I found it in large scattered flocks mixed with Mongolian Shore-Plovers, but not associating with them in a marked manner. The birds met with in the Hambantota district in the breeding-time were in little troops of five or six, and were frequenting the mud flats surrounding the half-dried leways. I obtained a pair (one of which has been already alluded to as having slight signs of the summer dress) which were at a little distance from a small company of their kind, and were engaged in bowing to one another and strutting about in the performance of a little quadrille. These birds had evidently paired and were engaged in courtship; yet they were not about to breed, as I found

on dissection, and the female was in perfect winter plumage. The flight of this species is very strong, and when going down-wind they proceed with great speed; the white rump is very conspicuous when they are on the wing. Their note is in tone like that of *T. minuta*, but it is stronger. The diet I have always found to consist of small aquatic insects; and the flesh of this Stint is very good eating. Dr. Saxby publishes some interesting notes on the species as observed in the Shetland Isles, and remarks that when they mix with Dunlins they cease thinking of their own movements, leaving themselves entirely under the direction of their new friends. At high water he found that they resorted to stubble-fields to repose, and were so little on the alert that they would allow themselves to be walked up to before taking notice of the intruder. He writes:—"I once winged a Curlew Sandpiper from a mixed flock; and as it fell upon a small shingle bank surrounded by the water, about a dozen of its own species, separating themselves from the Dunlins, alighted upon the shingle and began feeding; and when I threw stones over them, wishing to drive the wounded bird into the water, so that it might drift ashore, the only effect was to cause them to crouch down as if a Hawk were passing over; and it was not until I had waded within a few yards of them that they flew off and rejoined their late companions."

Nidification.—The Pygmy Curlew doubtless breeds in the extreme north of Siberia, as on the Taimyr river Von Middendorff killed a specimen in June with a partially-shelled egg in its oviduct; but he did not succeed in finding the eggs, the discovery of which, together with those of the Knot, yet remain to reward the labours of some adventurous ornithologist. An American writer has lately announced the taking of this Stint's eggs in Greenland; but Captain Feilden is of opinion that they have been mistaken for the Dunlin's.

TRINGA MINUTA.

(THE LITTLE STINT.)

Tringa minuta, Leisler, Nachtr. Bechst. Nat. Deutschl. i. p. 74 (1811); Gould, B. of Eur. iv. pl. 332 (1837); Middendorff, Sibir. Reise, ii. p. 221 (1853); Kelaart, Prodrumus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 690 (1864); Sharpe & Dresser, B. of Eur. pt. 7 (1871-72); Holdsworth, P. Z. S. 1872, p. 474; Hume, Str. Feath. 1873, p. 242; Adam, *t. c.* p. 396; Legge, *t. c.* p. 491; Von Heuglin, Orn. N. Ost-Afr. ii. p. 1189 (1873); Hume, Str. Feath. 1874, p. 298; Legge, Ibis, 1875, p. 402; id. Str. Feath. 1875, p. 205; Butler & Hume, *ibid.* 1876, p. 17; Armstrong, *t. c.* p. 342; Seebohm & Harvie Brown, Ibis, 1876, p. 294, pl. vii.; Hume, Str. Feath. 1878 (B. of Tenass.), p. 461; Ball, *ibid.* 1878, vii. p. 228; Hume, *ibid.* 1879 (List B. of Ind.), p. 113.

Pelidna minuta, Boie, Isis, 1826, p. 979.

The Little Sandpiper, Latham; *The Dwarf Sandpiper*, Kelaart; *Zwergstrandläufer*, German; *Kunaku*, Samoyedes on the Taimyr river (Middendorff); *Krungi* in Amoor Land (Schrenck). *Chota pan-loha*, Hind. (Jerdon); *Kotan*, Ceylonese Tamils.

Winter plumage (Ceylon). *Adult male and female.* Length 5·8 to 6·1 inches; wing 3·6 to 3·95; tail 1·6 to 1·8; tarsus 0·8; middle toe and claw 0·75; bill to gape 0·7 to 0·75, at front 0·71 to 0·76.

Iris brown; bill black; legs and feet deep leaden, in some with the centre of the tarsus pale or greenish.

Head, back, and wings greyish brown, darkening into blackish brown on the lower back, and into black on the upper tail-coverts; the centres of the feathers on the light portions dark brown, occupying a considerable portion of the feather on the back and scapulars; least wing-coverts uniform brown; quills blackish brown, the shorter primaries edged, and the secondaries and greater coverts (the latter very broadly) tipped with white; all the primary-shafts white; tertials and centre tail-feathers sepia-brown, edged with fulvous-grey, the remaining tail-feathers gradually paler to the outermost; a dark stripe through the lores; above it a broad supercilium extending across the forehead; face, throat, fore neck, and all beneath, with the sides of the rump, white; beneath the eye and the ear-coverts brownish, striped on the upper part of the cheeks in most with white; sides of the chest brownish grey in some.

Summer plumage (Valley of the Yenesay, lat. 71½°, August 8, 1877). *Females.* Wing 3·7 to 3·75 inches; tail 1·7; tarsus 0·8 to 0·9; middle toe and claw 0·78 to 0·8; bill to gape 0·75 to 0·78.

(Petchora, July 22, 1875.) Wing 3·8 inches; tarsus 0·8; middle toe and claw 0·71.

(Yenesay). Top of the head, back, scapulars, and tertials black, the feathers edged with rufous-tawny; hind neck and sides of head yellowish tawny; feathers of the crown clearly edged with rufous-tawny, the black not extending down to the bill, above which, on the forehead, the feathers are dusky; face and ear-coverts tawny, streaked with dusky grey, which forms a sort of streak through the lores; on the hind neck the dark centres are narrow, the tawny colour predominating; rufous margins of the scapulars broader than on the upper back; lower back and rump uniform blackish brown; upper tail-coverts and central tail-feathers edged with rufous of the same hue as the tertials; some of the greater wing-coverts margined with rufescent; remaining tail-feathers pale brownish as in winter, the two outer pairs whitish beneath; throat white, *tinged* with rufescent, the centres of the fore-neck feathers with dark terminal spots; from the chest to the vent white, slightly tinged with buff.

This example is in richer plumage than the others, which have the tawny of the hind neck and sides of a paler hue; the throat almost white, with the fore-neck spots more clearly defined and the feathers not so uniformly tinged with rufous. The characteristic of the Petchora specimen is its more uniformly black head and back. This dress, which is mostly assumed by change of colour in the feathers, is commenced as early as March in Ceylon, the scapulars and tertials being the first to change.

Obs. The summer plumage of this Stint, the first time that it is assumed (and the same rule must apply to other members of the genus), differs from that of succeeding years in having the wing-coverts edged with rufous. This is in reality an immature characteristic, the feathers, up to the time being, not having been moulted; and they become slightly intensified in colour, together with the back and scapulars, having been throughout the winter edged with rufescent. After the moult succeeding the first breeding-season the wing-coverts assume their adult grey colour, and never change afterwards.

Young, nestling (Dvoinik). Back and wings ferruginous buff, mottled coarsely with black; forehead, face, and hind neck buff, a dark stripe through the lores; crown black, mottled with whitish buff; ear-coverts tipped with black, and a spot above them; under surface whitish, with a buff wash across the throat; thighs buff, mottled with black. Bill at front 0.39 inch; tarsus 0.73; middle toe and claw 0.74.

Immature (Heligoland, September). Wing 3.8 inches. Head blackish, the edges of the feathers buff; a white eye-brow passing to above the ears; hind neck brown, the feathers edged with greyish and with buff on the sides of the lower part; interscapular region black, some of the feathers edged with white, others with buff; scapulars blackish, with white tips and edges; wing-coverts and tertials edged with rufous-buff; quills as in the adult, but with the shorter primaries edged at the base with white; central tail-feathers edged with dusky fulvous; beneath white, tinged on the chest and breast with buff.

Obs. As found in Ceylon in its *winter plumage*, the *short toes and dark legs* distinguish this species at once from the next; but its lighter upper surface, white forehead, and unmarked chest enable it equally well to be discriminated from the Long-toed Stint at a momentary glance.

The eastern form of this Stint is the *T. albescens* of Temm., to which the prior name of *T. ruficollis*, Pallas, undoubtedly, I think, applies. It is a larger bird, having a longer wing and a proportionately larger tarsus and foot. One specimen in the Swinhoe collection measures 3.9 inches in the wing, seven 4.0, and four range between 4.1 and 4.35. It is almost indistinguishable from *T. minuta* in its winter plumage, but will, I think, always be found to have a pure white chest and a greater extent of white on the forehead, as well as a greyer upper surface. In summer livery, however, it has the face, neck, and chest fine rufous, the chin whitish, and the breast-feathers with dark central spots; the feathers of the head and back are black, edged with rufous, which predominates on the hind neck; the outer tail-feathers are pale brown; and the 2nd quill-shaft varies (it is generally white on the terminal half, but in some specimens it is whity brown). I was disposed at one time (Str. Feath. 1876, p. 205) to think that this species visited Ceylon; but in re-examining my specimens I find that they are not large enough and white enough on the chest to be safely included in its ranks.

In connexion with this species it will be well to mention that the middle figure in pl. 332, 'B. of Europe,' of *Tringa minuta* is *Tringa albescens* = *T. ruficollis* in summer plumage. Gould's description of *T. albescens*, Temm. (Birds of Austr. vi. pl. 31), refers to an example in partial change only; it reads, "sides of the breast spotted with dark brown and stained with rusty red in the centre." It is possible, however, that after all there may be two species of rufous-chested Stints, and that Gould's may be a local southern form of *T. ruficollis*, for he affirms that this bird was found breeding off the west coast of Australia.

T. minutilla, Vieill., the American representative of *T. minuta*, is smaller than it, measuring in the wing 3.3 to 3.6, and has the chest in summer plumage thickly spotted with brown and tinged with ashy fulvous; the chin is whitish, and it is altogether a darker bird.

Distribution.—The Little Stint is the most abundant by far of its genus in Ceylon. It is found all round the north coast from Negombo to Jaffna, and thence down to Hambantota; and within these limits is almost universally distributed wherever the locality is suited to its habits, being met with in very large flocks, far outnumbering its congeners noticed in the last and next articles. It is unusual to find it far inland; but it may be met with some miles from the sea-coast about small tanks, water-holes, and other fresh waters, and, of course, follows up salt lagoons to their source. I met with it at the Kanthelai tank. It is numerous on the extensive sands of the Jaffna lake, and on the immense flats above Elephant Pass it was the only small shore-bird besides the Kentish Plover that I saw there; it was very common on the Pootoor lagoons in the Jaffna peninsula, at which the next species was also pretty plentiful. I never met with it on the shore south of Negombo, for there are few spots between there and Matara suited to its habits; but it probably affects the mouths of the rivers on that stretch of coast. The Hambantota district is the only one in which I saw it during the S.W. monsoon; but the number of barren birds there were not equal to those of the Curlew Stint.

It is very abundant in India, being especially numerous near the sea-coast, but frequenting also the borders of large rivers and tanks. Mr. Hume records it from "various parts of Sindh, the Punjab, the North-west Provinces, Sindh, the Central Provinces as far as Raipur, and Bengal as far east as Dacca." In 1874, Mr. Ball, writing on the birds of Chota Nagpur, says it is the only species of Stint he obtained in that province; but apparently, in his list published in 'Stray Feathers,' vol. vii., the next species is substituted for it; and Mr. Hume inserts it on his own authority from Raipur only. In the Deccan, however, which is a more inland district, Messrs. Davidson and Wendersay that it is very common in the cold weather. Captain Butler records it only from Deesa in the Guzerat province; but Mr. Adam asserts it to be very numerous at the Sambhur Lake in Jodhpore, remaining there until May, on the 25th of which month he has obtained it in full summer plumage. Non-breeding birds are stated by Captain Butler to be found at Kurrachee in the hot season; and this is not to be wondered at when the same thing occurs in Ceylon. On the eastern side of the bay it is chiefly a sea-coast bird. Dr. Armstrong found it extremely abundant all along the sea-shore between Elephant Point and China Bakeer; but it is not recorded from Upper Pegu. In Tenasserim it is rare and only found on the coast. In the Andamans it is not uncommon, and has been obtained there, as in Ceylon, in winter plumage during the month of June. In the Nicobars it was met with occasionally.

Dr. Stoliczka observed it about swamps at Yarkand and Kashgar during the first half of the winter; but it seems to have been passed over by Dr. Seully. In Turkestan proper it is found on passage in the northern and south-eastern districts, and is met with up to 4000 feet above the sea. It occurs, of course, on the Caspian; and in Palestine Canon Tristram obtained it in winter. Mr. Seebohm found it breeding in the Yenesay valley, but did not see it south of lat. $71\frac{1}{2}^{\circ}$. Dr. Finch likewise met with it on the Podarata river, N.W. Siberia. Von Middendorff found it common in the extreme north of Siberia on the Taimyr river, and likewise in the south-east of that country. As high up as lat. 74° he observed it on the 17th of June. Von Sehrenck procured it on the Amoor and the Schilka, and he says that it is commoner in that region than *T. temmincki*.

In the breeding-season it is spread over Northern Europe, having been procured and noticed on the White Sea, the Petchora (where Messrs. Seebohm and Harvie Brown took its eggs), in Fiuland, Lapland, and Northern Scandinavia, and even in Nova Zembla and Waigats Island, where Von Heuglin met with it, in the latter place, as late as September. In Great Britain and Central Europe it is a bird of passage in spring and autumn, but it appears to be more commonly met with in the latter season than the former; this is the case both in England and Eastern Europe. In Sardinia it remains throughout the winter; but in Southern Spain it is chiefly a bird of passage. Col. Irby found it in Andalucia, consorting with Dunlins and Ring-Dotterels; and in Morocco he met with vast flocks of it. Mr. Tyrwhitt Drake likewise observed it in the latter country. In Egypt, it is, writes Captain Shelley, extremely abundant, frequenting both marshy grounds and sand banks. In the Sinai district Mr. Claude Wyatt procured it. Von Heuglin found it along the Nile and its tributaries, on the shores of the Red Sea, in the Gulf of Aden, and in the marshes of East Kordofan in autumn, winter, and spring; he met with it near Suez in breeding-plumage in May; but all throughout North-eastern Africa he says it is not so abundant as Temminck's Stint. Mr. E. Newton found it common in the island of Mahé in the Seychelles; but I do not know that it has been seen in Madagascar. In South Africa it is common in winter. Captain Shelley found it in flocks in Cape colony; and in Natal and the Transvaal Mr. Ayres also procured it, and saw it in numbers in some localities; at Potechefstroom he obtained a specimen as late as the 10th April, which was commencing to assume the breeding-dress. Layard writes that it is common in all marshes and on the sea-board in Cape colony.

Mr. Andersson records it from Damara Land; and it has also been obtained in Benguela, on the Gold Coast, in Sierra Leone, and at other places on the west coast. At Cape-Coast Castle Captain Shelley found it plentiful in spring.

Habits.—This Stint associates in larger flocks than other species in Ceylon, and is in this respect, as well as in its general habits, very like the Dunlin. When feeding on the ooze or at the edge of the tide, in the salt lakes and lagoons which it frequents, it does not "pack" closely together, but remains in scattered company, so that a flock of fifty or more covers a good extent of ground. When alarmed, the whole rise at once and glance off with arrow-like speed, coming together on the wing, and then, perhaps, making a sharp

turn, they will all fly back *en masse*, but drawn out in a "string," which swerves on its headlong course, and shows the white of the under surface and then the brown of the back of the birds alternately to the spectator. I have always found it shier than the Long-toed Stint; it does not readily admit of a near approach, but will generally rise at a long gun-shot: when roused from a good feeding-spot it is loathe to alight elsewhere; and I have known a large flock split up into small parties on being put up, which flew round and round, and, as I passed on, reunited and settled down where they had been flushed from. They are seldom found on marshy ground in Ceylon, but restrict themselves almost entirely to the mud and ooze, feeding along the edge of the water when the tide is in. They associate with the Long-toed Stint, and sometimes with the Kentish and the Mongolian Shore-Plovers. Their note is shrill, but not loud, and consists of two syllables, which they utter constantly on the wing or when rising; their diet consists of minute shells and insects.

Nidification.—The present species breeds in the extreme north of Siberia and Europe. Von Middendorff found its nest on the 1st of July in the Taimyr country; and in the beginning of August Dr. Finckh took its eggs on the Podarata river near the Bay of Kara. It is, however, from the interesting paper of Messrs. Seeböhm and Harvie Brown on the birds of the Lower Petchora that we learn most about its nidification and its interesting habits while breeding. These naturalists found a number of nests on the shores of, and on the islands in, the "Inland Sea," an inlet of the Petchora Gulf, in lat. $68\frac{1}{2}^{\circ}$. A long account is given of these Little-Stint discoveries, with a minute description of the geographical features of this singular region, the nature of the locality, and the ground on which the nests were found; and, notwithstanding that my space will ill admit of it, I am compelled to subjoin some interesting extracts illustrative of the breeding-home of this species:—"The inland sea is shut off from the Petchora Gulf, to the north of the Boluanskai Bucht, except at their point of junction, by a peninsula, the seaward side of which consists of a range of sand hills covered with esparto-grass, lowering towards its extremity to a gravelly sandy ridge, which latter, sweeping inland in a circle, comes to a sharp point, and forms a promontory on the shore of the inland sea. Inside the sand hills there is a level green meadow studded over with many small pools, and intersected by narrow winding lanes of brackish and stagnant water. Many of these pools are of curious shapes, having almost an artificial appearance, their edges, about a foot in height, being perpendicular and even, as if cut by a spade. At the bottom, below a foot or two of water, is a deep, tenacious, bluish-black mud, which, if disturbed, gives off a powerful and offensive smell. Quantities of water-plants grow on the surfaces of some of them, sometimes almost choking them up. It is upon the edges of the pools, and on the shores of the inland sea adjoining, that the flocks of wading birds are found at feeding-time.

"The inland sea is a large sheet of water connected with the Petchora Gulf by a narrow channel between the two low sand capes of Dvoinik, and is about $2\frac{1}{2}$ versts across in any direction. It is surrounded by a strip of grassy meadow-land on a gentle slope above high-tide mark, which is from 40 to 100 yards in width, except, as already mentioned, on the seaward side, where it is replaced by the level meadow with a different and coarser vegetation. The whole stretch of this sloping meadow is covered with yellow grasses and carices; and here and there over its surface are diminutive plants of dwarf-willow (*Salix glauca*), considerable quantities of wild leeks, and isolated patches of a species of *Sphagnum*. Surrounding this, again, is the tundra, which, in some places, rises abruptly in a great wall 6 or 8 feet high, and in others slopes gently till it meets the meadow. At the latter points the vegetation of the tundra proper is found to blend with that of the meadow. A ridge of bleached and weather-worn drift wood of all sizes—branches, huge trunks, and roots—lies piled up close to the margin of the tundra; and small pieces are strewn over the surface of the meadow. The high-tide mark at the lower edge of the meadow is, in most places, sharply defined, an abrupt bank, a foot or two in height, having been formed by the action of the water. At low tide about forty yards of the black ooze is exposed; and upon this, as already noted, flocks of Dunlins, Stints, and other Waders are usually seen at feeding-time.

"The river Dvoinik runs into the inlet close to the sea, flowing from a southerly and easterly direction. It is a muddy still stream, with oozy bottom; and the tide ascends its tortuous course for several versts. The tundra on either side dips sharply down, forming steep banks on the upper reaches; but these give place, near its confluence with the sea, to low perpendicular banks cut through level meadow-land similar to what has already been described.

"It was upon the sloping tundra, and upon the sloping meadow, that we found all our nests of eggs and young in down of the Little Stint. This part of the tundra bears a thick growth of arctic bramble (*Rubus arcticus*), which, in some places, scarcely leaves a square yard free of vegetation. The dwarf rhododendron (*Ledum palustre*) is also abundant, but is small and inconspicuous. Large quantities of deep, soft, faded *Sphagnum* cover also a considerable part of the ground; and growing through this are *Carices* (*Carex rariflora* and another) and grasses, and a green star-shaped moss, the latter being the same which is often found on the ground frequented by the Grey Plovers. Reindeer-moss is scarce upon this Little-Stint ground, growing only in patches here and there; but the innumerable small round hummocks, with which parts of it are thickly covered, bear a thin crust of minute white lichen, which, blending with the darker colour of the peat soil upon which it grows, gives a hoary appearance to the higher portions of the slope."

The nests were little depressions made in the ground or with soft yellow *Sphagnum*, of which the turf in some places consists to the depth of 4 inches; some were rather rough and untidy round the edge, and only sparingly lined with small leaves, which might "have been plucked by the bird as she sat on her nest." The nests made in *Sphagnum* had the appearance of being formed by the pressing-down of the moss by the bird's body; those which were in turf not consisting of *Sphagnum* were lined "with more leaves—dried dwarf willow (*Salix glauca*) and arctic bramble, either gathered by the bird herself or drifted into them by the wind." Another nest was in loose sandy soil, the little excavation being lined with dried willow-leaves and bits of *Carex*. The eggs were in all cases four in number, miniature Dunlin's in character, the ground-colour varying from greenish white to dusky olive-grey, and most of them richly blotched at the larger end with rich reddish brown, the darker eggs being similarly marked all over, and in one specimen the markings run into one another so as to form very handsome irregularly-edged clouds. They are pyriform in shape, some being more compressed at the small end than others, and vary from 1.13 to 1.15 inch in length by from 0.8 to 0.84 in breadth. The old birds exhibited a most charming ignorance of danger (which unfortunately, in the interests of science, had to be taken advantage of), having the habit, in common with most Waders, of feigning lameness or a broken wing, and trailing themselves along the ground to entice the intruder from their nests; but when he was accompanied by a dog they showed much more timidity. The following extract from Mr. Harvie Brown's journal, published in the article in question, is illustrative of the nature of these interesting little birds:—

"As I came nearer I saw a small bird flying in circles round him (Piottuch) and Simeon, and alighting now and again close to them. Seeing this I ran forward, and Piottuch held out two young Little Stints, not more than a day, or at most two days out of the shell. I sat down; and ere many seconds elapsed the old bird alighted within a yard or two of our feet, uttering a very small, anxious, whistling note. My gun lay on the ground beside me, within reach of my hand; and I put down one of the young about six inches beyond it. Almost immediately the old bird advanced close up to it, and, uttering its low notes, endeavoured to lead it away. Piottuch then held out the other young one in his left hand, and it uttered a scarcely audible cheep. The old bird advanced fearlessly to within twelve inches of his hand; and he nearly caught it. I then shouted to Seebohm to come, being at the same time prepared to shoot the bird if it flew away to any distance; but no, it only flew about ten or fifteen yards, and then began to sham lameness, tumbling about amongst the little hummocks and hollows, and never going further from us than about thirty paces. Seebohm now came up, and took his seat beside us. The old bird became a little shier, but still flew round us in circles, alighting, as before, from time to time."

On the Yenesea Mr. Seebohm had eggs brought to him in lat. $71\frac{1}{2}^{\circ}$ by a Samoyede, which were taken in the middle of July.

TRINGA SUBMINUTA.

(THE LONG-TOED STINT.)

? *Totanus damacensis*, Horsf. Trans. Linn. Soc. xiii. p. 192 (1821).

Tringa subminuta, Midd. Sib. Reise, p. 222, t. xix. fig. 6 (1853); Schrenck, Reisen u. Forsch. Amur-L. i. p. 424 (1860); Jerdon, B. of Ind. iii. p. 691 (1864); Legge, Ibis, 1875, p. 402.

Tringa salina, Pallas, *apud* Sharpe & Dresser, B. of Eur. pt. 7, "*Tringa minuta*," p. 5 (1871); Holdsw. P. Z. S. 1872 (first record from Ceylon), p. 474; Legge, Str. Feath. 1873, p. 491.

Tringa ruficollis, Pallas, *apud* Walden, Trans. Zool. Soc. 1875, ix. p. 234; Hume, Str. Feath. 1878 (B. of Tenass.), p. 461; Ball, *ibid.* vii. 1878, p. 228; Hume, *ibid.* 1879, viii. p. 113 (List Ind. Birds).

Tringa damacensis (Horsf.), Swinh. Ibis, 1863, p. 413; Schlegel, Mus. P.-B. *Scolopaces*, p. 48 (1864); Blyth, Ibis, 1867, p. 168; Swinhoe, P. Z. S. 1871, p. 409; Hume, Str. Feath. 1873, p. 242; Oates & Hume, *ibid.* 1875, p. 182; Blakiston & Pryer, Ibis, 1878, p. 221; Seebohm, Ibis, 1879, p. 226.

Actodromas salina (Pall.), Salvadori, Ucc. di Born. p. 324 (1874).

Tringa minuta (lapsus calami*), Legge, Ibis, 1874, p. 29.

Pallas's Stint of some; *Sandpiper*, *Sand-Lark*, Europeans. *Kotan*, Tamil.

Olawatuwa, Sinhalese.

Adult male and female (Ceylon). Length 6.0 to 6.25 inches; wing 3.65 to 3.8; tail 1.5; tarsus 0.8 to 0.9; *middle toe and claw* 0.9 to 1.0; bill to gape 0.72 to 0.81.

Iris brown; bill blackish yellowish or yellowish green at base beneath; legs and feet yellowish olivaceous, the joints plumbeous and the toes slightly greenish.

Winter plumage (Ceylon). Head, hind neck, back, scapulars, and tertials deep sepia-brown, darkening into black on the rump and upper tail-coverts, and edged, except on these latter parts, very broadly with brownish ashy; wing-coverts of a slightly paler brown, with the edgings greyish white; quills and centre tail-feathers blackish brown, paling on each successive tail-feather to the outermost, which is very light brown; secondaries and their coverts, and all but the centre tail-feathers, tipped with white; the 1st primary with a *sullied white* shaft, the *remainder brown*; lores, cheeks, sides of neck, and the chest striated with brown; the ear-coverts almost uniform; in front of the eye a darkish spot, above the lores a white streak (not extending to the point of the forehead); chin, throat, and under surface, with the sides of the lower back and rump, white, with either a greyish or greyish-brown wash over the striated part of the chest and the upper flanks; under wing-coverts white, the lesser rows with dark bases.

Summer plumage (Amoor Land, Dr. Maack). *Female*. Wing 3.72 inches; tail 1.4; tarsus 0.87; middle toe and claw 0.95; bill at front 0.76.

Head, back, scapulars, rump, and centre tail-feathers brown-black, the rump and tail-coverts uniform, the rest margined with rufous; the centre tail-feathers edged with rufous-buff; the hind-neck feathers broadly margined with buff; tertials edged with buff and rufous; least wing-coverts uniform brown, the greater edged with rufescent buff; quills as in winter; the black of the forehead comes down to the bill; lores, above the eye, and the face whitish, streaked with brown, particularly on the ear-coverts; chin and gorge unspotted white; a buff wash across the centre of the throat, and the feathers with dark shaft-lines; rest of the under surface white; a few spots of brown on the lower flanks.

* Correctly spoken of as *T. salina* in Str. Feath. 1873, p. 491, the Stint of the Galle district.

A series of six skins in summer plumage, from China, correspond with the Amoor example in having no rufous on the chest; their plumage is of precisely the same character, but varies in individuals as regards the intensity of the upper-surface colouring, and in the amount of striation on the chest and *sides* of the neck. The length of the middle toe and claw varies from 0.93 to 0.97 inch in these.

Young. I have not been able to examine either a nestling or young bird in first plumage of this species, and I am not aware that the former has ever been procured.

Obs. As this Stint does not assume a rufous chest or throat in summer, Pallas's name *ruficollis* (Reis. Russ. Reichs, iii. p. 700, 1776) cannot apply to it. He described, I am convinced, a specimen of the eastern form, hitherto styled *T. albescens**, in breeding-plumage, "*subtus collum totum ad pectus usque intense ferrugineum*" being his expression. Pallas described many years afterwards (Zoogr. ii. p. 199, pl. 61, 1811-31, ex Pallas) a Stint as *T. salina*, which he identifies with *T. ruficollis*; and he says of it:—"Jugulum ferrugineo-nebulosum album, punctis fuscis in masculo crebrioribus." Pallas may have either rightly or wrongly identified the second bird with the first; and this description might perhaps be held to apply to the Long-toed Stint as much as to an example of the rufous-chested one in partial plumage. The main point is that no mention of the toes is made; and I therefore maintain that the term *salina* should not be considered to apply to the Long-toed Stint. Middendorff, however, is particular to speak of the length of the middle toe, and even gives a drawing of it, which measures the same as that of a Ceylon specimen.

Horsfield's *Totanus damacensis* does not seem to me to be sufficiently well characterized to indicate the present species. It is as follows:—"T. supra pallide cinereo-fuscus, subtus albus, remigibus fuscis, rachidibus primorum albis aliarum fusciscentibus. Long. 6½ poll." "*Supra pallide cinereo-fuscus*" applies more to the upper surface of *T. temmincki* or even *T. albescens* than to the dark-centred light-edged feathers characteristic of the present bird. "*Subtus albus*": no mention is made here of the darkish chest; and this applies more to *T. ruficollis* in winter plumage. "*Remigibus fuscis, rachidibus primorum albis aliarum fusciscentibus*," applies to the present species, but so also to the next, *T. temmincki*. Finally, the length is too great for any of these small Stints, except perhaps *T. ruficollis*. As further proof that Horsfield was not very clear as to the species he was describing, I may remark that there are two specimens in the India Museum labelled in his own handwriting *Totanus damacensis*, one of which is the large form of *T. minuta*, and the other the present species in moult, with the 1st primary undeveloped. I prefer, therefore, to adopt Middendorff's name, so concise is he in describing the species and alluding to the long toes.

Distribution.—This species is, from all accounts, less common in India than in Ceylon. It is plentiful all round the north coast of the island, in the Trincomalee district, and about the salt lakes of the Yāla and Hambantota country. I likewise found it in newly-ploughed paddy-fields in pairs or in small troops of three to six, with *T. glareola*, in the Galle district, in the month of January; and it was the only species of Stint which I noticed on that part of the island, as I never met with it on the west coast south of Madampe. A noteworthy capture of an individual is that by Mr. Bligh, who procured it in May 1876 at the foot of the Catton valley, at an elevation of 2000 feet. This bird was evidently on passage to the north, and was making its way from the Hambantota district across the Central Province. In the north, where it is common, it is not so plentiful as *T. minuta*, as this latter species musters there in great numbers; and at Aripu I observe that Mr. Holdsworth only procured two specimens, which were the first recorded from the island. Layard seems to have passed it over, or else did not distinguish it from the Little Stint, for where he collected largely, in the Jaffna peninsula, it is tolerably common. I met with examples of it at Hambantota in July, but they showed no signs of summer plumage.

Until quite recently this Stint was not noticed in India. Jerdon calls attention to it as an allied species to the next, and merely mentions that it is found in the more eastern parts of India and Burmah. Writing in 1873, Mr. Hume remarks that he has never seen it in continental India; but two years later he records it from Pegu, and publishes Mr. Oates's remark that it "is very common during the cold weather on sand

* The synonymy of this Stint, referred to in the previous article, I conceive to be as follows:—

Tringa ruficollis, Pallas, Reis. Russ. Reichs, iii. p. 700, "Dauria" (1776).

Tringa salina, Pall. Zoogr. Rosso-As. ii. p. 199, pl. 61 (1811-31).

Tringa albescens, Temm. Pl. Col. 41. fig. 2 (1824).

? *Schoeniclus australis*, Gould, B. of Austr. vi. pl. 31 (1848).

banks and edges of ponds, and in flocks of from ten to thirty." About Calcutta in the cold season it is to be found in equal numbers with the Little Stint. Mr. Ball records it from Sambalpur and Lohardugga, which are the only two localities as yet published in which it has occurred. As a matter of necessity, however, it must be, to a certain extent, located along the east coast of the peninsula, by which route it travels south to Ceylon. It is unknown in the north-west of the empire, and we have no record of its occurrence on the west coast. As it is a bird of eastern distribution, it is, no doubt, more common on the eastern side of the Bay of Bengal, and will, when that region has been more thoroughly examined, be found along the coast of Tenasserim and the Malay peninsula. At present it has only been obtained at Tonghoo by Capt. Ramsay, and at Thatone and Yea, in Tenasserim, by Mr. Davison. Further south it has been procured at Malacca; and in Java it was obtained by Kuhl, Van Hasselt, and Horsfield. Its range extends to Borneo, where Schwaner obtained it, and thence to Celebes, beyond which island it has not as yet been met with.

Its summer quarters are North-eastern Siberia and Amoor Land, from which region it was described by Middendorff. It does not, however, appear to be abundant in such places which have been visited, and its true breeding-home has evidently not been discovered. Von Middendorff met with only two examples in all his travels; one was procured on the western slopes of the Stanowoi Mountains, and the other at the mouth of the Uda; both were shot in the summer, and they form the types of his *T. subminuta*. Schrenck likewise procured one pair only on the Amoor river, near the mouth of the Ssungari tributary, on the 19th of July. Prjevalsky says that it inhabits the whole of South-east Mongolia, with the exception of the Ala-shan; but he did not see it at all in Kan-su and about Koko-nor. Mr. Blakiston procured it in Kamtchatka and also in Yezo. Swinhoe obtained it on the China coast and in Formosa, and remarks that it passes down early and returns late. It extends eastwards to the Philippines, where Dr. Meyer procured a specimen in Luzon in February, which is noticed by Lord Tweeddale in his list of Philippine birds.

Habits.—This pretty little Stint, though affecting the vicinity of the sea-shore, is more of a marsh-bird than other members of its genus in Ceylon. Its favourite resort in the Trincomalie district was the salt marshes bordering the ooze surrounding the lagoons; these are covered for about an hour before and after the flood, and are overgrown with rank grass and intersected with little pools and watercourses leading to the muddy foreshore. I frequently met with the Long-toed Stint at these spots in company with *Totanus stagnatilis* and *T. glareola*, three or four individuals being the usual number mixed up with half a dozen of these Sandpipers. When feeding at the edge of the ooze, or upon it, it generally consorted with its more numerous relative the Little Stint. At times I have seen it in small parties of six or a dozen feeding in "extended order" in long grass, which concealed them from my approach, and I then flushed them close to my feet, like so many Snipe. In the summer season, when they were seen in the Hambantota district, they were on the shores of the leways, associating with Curlew Stints and *T. minuta*. When I met with them in the paddy-fields in the south of Ceylon they were found mixing with Wood-Sandpipers and feeding on the newly upturned mud; and the stomachs of those I shot contained small insects and animalculæ. Elsewhere I have seen it round isolated pools or paddy-fields near the sea, and have noticed it consorting with the Ringed Plover (*Ægialitis curonica*). Its note is a weak trilling whistle, resembling in tone that of most Stints, and not unlike that of the Dunlin, but much weaker of course; it is not so loud as that of *T. minuta*. Its flight is very swift, and when a little flock are proceeding at a great pace in close company they turn and twist, alternately showing the upper and lower plumage in the same manner as the Little Stint. The stomachs of all the specimens examined contained a large quantity of gravel mixed with the diet partaken of, which consists chiefly of small aquatic insects and also flies which they pick off the grass.

I know nothing of its nidification and am not aware that its eggs have ever been found.

In 'The Ibis,' 1864, p. 420, Swinhoe mentions having seen what he considered to be an example of *T. albescens* in the Museum of the Asiatic Society at Colombo. In this collection, however, there were, at that time, birds from other localities than Ceylon; and therefore the presence of a specimen in it was not a certain guarantee that its habitat was Ceylon.

TRINGA TEMMINCKI.

(TEMMINCK'S STINT.)

Tringa pusilla, Lath. Ind. Orn. ii. p. 737 (1790, *nec* Linn.).

Tringa temminckii, Leisler, Nacht. zu Bechst. Naturg. Deutschl. ii. p. 75 (1811); Gould, B. of Eur. iv. pl. 333 (1837); Blyth, Cat. B. Mus. A. S. B. p. 270 (1849); Von Middendorff, Sibir. Reise, ii. p. 221 (1853); Schrenck, Reisen u. Forsch. Amur-L. p. 422 (1860); Schlegel, Mus. P.-B. *Scolopaces*, p. 47 (1864); Jerdon, B. of Ind. iii. p. 691 (1864); Swinhoe, P. Z. S. 1871, p. 409; Sharpe & Dresser, B. of Europe, pt. 7 (1871); Shelley, B. of Egypt, p. 252 (1872); Hume, Str. Feath. 1873, p. 244; Legge, *t. c.* p. 491 (first record from Ceylon); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1192 (1874); Irby, B. of Gibraltar, p. 173 (1875); Legge, Ibis, 1875, p. 412; Hume, Str. Feath. 1875, p. 183; Butler & Hume, *ibid.* 1876, p. 17; Fairbank, *t. c.* p. 263; Seebohm & Harvie Brown, Ibis, 1876, p. 308; Hume, Str. Feath. 1878 (B. of Tenass.), p. 161; Ball, *ibid.* 1878, vii. p. 228; Hume, *ibid.* 1879, viii. (List B. of Ind.), p. 113; Seebohm, Ibis, 1879, p. 149; David & Oustalet, Ois. de la Chine, p. 473 (1877).

Pelidna temminckii (Leisl.), Boie, Isis, 1876, p. 979.

Leimoneites temminckii (Leisl.), Kaup, Natürl. Syst. p. 37 (1829).

Actodromas temminckii (Leisl.), Salvadori, Uccelli di Born. p. 324 (1874); Cripps, Str. Feath. 1879, p. 303.

White-tailed Stint, *White-tailed Sandpiper* of English writers; *Bécasseau Temminck*, French; *Temminck's Strandläufer*, German; *kleniste Strandlooper*, Dutch.

Adult male and female (Petchora valley: coll. Seebohm). Wing 3.75 to 3.8 inches; tail 1.8 to 2.0; tarsus 0.65 to 0.68; middle toe and claw 0.7; bill to gape 0.6 to 0.62.

Adult female (Ceylon, November). Length 6.1 inches; wing 3.95; tail 2.1; tarsus 0.7; middle toe and claw 0.75; bill to gape 0.65, at front 0.71.

The gape is more advanced in this species than the other small members of the genus (*T. minuta*, *T. subminuta*, &c.). Iris brown; bill black, lightish at the base of under mandible; legs and feet olivaceous greenish, joints dusky plumbeous.

Head and above *almost uniform* cinereous brown, darkening to blackish brown on the rump and centre of upper tail-coverts, and with the wing-coverts pale-edged; wings and tail dark brown, the secondaries and their coverts and inner primaries tipped white, the first quill-shaft *white*, the remainder *brown*; *two outer tail-feathers* pure white, and the adjacent paler brown than the centre pair; lores and face brown; a light streak in front and above the eye; chin, gorge, and under surface, with the sides of the rump and upper tail-coverts, white; chest and lower fore neck pale brownish, the feathers light-tipped, the whole forming a broad pectoral band.

Summer plumage. Adult male (lower Petchora valley, June). Above brown, the feathers of the head and back blackish, with greyish-buff and fulvous edgings; these are most conspicuous on the scapulars, where the black coloration is confined to the terminal portion of the feather; lower back and rump blackish brown, the feathers with indistinct pale tips; wings dark brown; the primary-coverts blackish brown; the secondaries narrowly tipped with white, and the primaries with the first shaft white and the remainder brownish; longer tertials with buff margins; outer tail-feathers blackish brown, the next two paler brown, and the remainder white, the third feather from the side being sullied; a dark line through the lores and the forehead scarcely paler than the crown; chin and throat white; fore neck and chest almost uniform brown, the feathers on the upper part with pale fulvous edgings; breast, lower parts, and under tail-coverts white; under wing brown, edged pale along the edge; axillaries white; legs olive-yellowish.

A female (same locality, May) is in similar plumage, the fulvous edgings of the upper surface somewhat lighter, and the chest not brown.

Young nestling (Warsilkova, Petchora, July). Ground-colour of upper surface buff-grey; crown and nape black, mottled with pale buff, the dark colour descending in a stripe to the base of the bill, on each side of which a light stripe runs back into the black of the crown; a fine dark line through the lores; back and wings marked with black, mottled with pale buff; under surface whitish; lower part of fore neck and across the throat buff. Bill at front 0.32 inch; tarsus 0.52; middle toe 0.52.

The dusky colour of the upper surface characterizes the nestling of this species.

Young in first autumn. Upper plumage brown, the feathers tipped with rufescent buff on the back and wing-coverts, the scapulars and tertials margined with the same; chest and breast tinged with buff.

Obs. I append some measurements of Indian specimens, as illustrative of the size of what may be presumed to be Asiatic-bred individuals, and which were taken from Furreedpore birds:—

Males. Length 6.0 to 6.25 inches; wing 3.28 to 3.62, expanse 11.25 to 11.50; tail 1.83 to 2.0; tarsus 0.6 to 0.66; bill from gape 0.66 to 0.68, at front 0.66 to 0.68. Weight 0.87 to 1.12 oz. (*Cripps*.)

Females. Length 6.10 to 6.3 inches; wing 3.66 to 3.83, expanse 11.5; tail 2.0 to 2.25; tarsus 0.66; bill from gape 0.66 to 0.7, at front 0.64 to 0.66. Weight 0.62 oz. (?).

The example from Ceylon above alluded to exceeds any of the above. For the better discrimination one from the other of the several small Stints inhabiting Ceylon, I subjoin a diagnosis of their respective characters in winter plumage:—

- (a) *T. minuta*. Forehead and eye-stripe white; feathers of back pale-edged and light brown in the centre; first shaft white, remainder brown at the base and white near the tips; two outer tail-feathers pale brownish; chest very lightly streaked with brownish grey; *middle toe shorter than tarsus, not exceeding 0.7 inch*; legs blackish or blackish leaden.
- (b) *T. subminuta*. Forehead brown; back-feathers very dark brown in the centre; first shaft white, remainder *all brown*; two outer tail-feathers pale brownish; chest with dark shaft-stripes to the feathers; *middle toe equal to the tarsus, attaining 0.9 inch in length*; legs olivaceous.
- (c) *T. temmincki*. Centre of the forehead brown; almost uniform brown above; first quill-shaft white, remainder all brown; two outer tail-feathers *pure white*; chest brownish.

Distribution.—I procured the specimen above described on the Tamblegam flats, where I shot it out of a flock of Little Stints which were frequenting the mud in a small tidal creek a mile or so from the shore. I am unable to say whether there were more examples than one, for it fell, with two or three of the latter species, to a shot fired into the flock. I never met with an example afterwards; and it has never been otherwise recorded from the island. It is, however, doubtless a yearly straggler to Ceylon, and passes unnoticed while mixing with the thousands of Little Stints that one sees.

In India it is found both on the sea-coast and in the interior. The Rev. Dr. Fairbank is the only naturalist that has observed it in the Deccan, whence he records it as occurring at Ahmednagar. Mr. Ball notes it from Hazaribagh, Lohardugga, and Orissa, to the north of the Mahanadi river, as also from the Godavari valley, while Mr. Hume records it from Raipur; the same author states that it is pretty common about Calcutta; and in Furreedpore it is “common in every pool of water and along the banks of rivers and creeks” (*Cripps*), being one of the earliest summer visitors in this part. It has been obtained once in Pegu by Mr. Oates; but in the Irrawaddy delta, where one would suppose it to be common, it was not noticed by Dr. Armstrong. Further south, in Tenasserim, writes Mr. Hume, “it is pretty common about inland creeks and pools in the central portion of the province, and again in the tracts west of the Sittang.” In this direction it does not seem to extend further south, nor has it been seen in the Andamans, although it may have been passed over there as in Ceylon.

In the north-west of India it is found in small flocks about tanks between Deesa and Ahmedabad in Guzerat; and it was met with commonly in Sindh by Mr. Hume, who states that it is distributed through all the adjacent provinces. It remains in the north of India until May, when it may be shot in full summer plumage. Its earliest arrival in Guzerat is, according to Captain Butler, the 5th of August. In Turkestan Severtzoff

asserts that it is found on passage in the north and south-east, and that it *breeds in the mountains of the west and north-east of the country between an elevation of 10,000 and 14,000 feet.*

Col. Prjevalsky says that it is tolerably common in S.E. Mongolia during the spring migration; and in the summer in July he met with it in the Hoang-ho valley, where he considers it probably breeds. "In Gobi," he remarks, "a few migrating individuals were observed during the month of August; they kept most to the small rain-pools. It does not occur in Kan-su; nor did we find it in Koko-nor; but its absence in the latter place might be accounted for by our being there only late in autumn and early in spring." Père David likewise found it common in Mongolia on the borders of rivers and lakes, and observes that it occurs in numerous flocks through China, remaining in the southern provinces during the winter.

It wanders very far north to breed. Von Middendorff observed it in Taimyr Land, on the river of that name, in lat. 74° N.; and Mr. Seeböhm met with it on the Yenesay. The first-named author states that it nests on the Boganida river, and also in the Stanowoi Mountains in Eastern Siberia. Mr. Seeböhm remarks that at the mouth of the Yenesay and on the islands of the delta it was by far the commonest species of its genus. Finsch states ('Ibis,' 1877) that he observed it with young on the isthmus of the Yalmal Peninsula; but he since writes that the birds observed were *T. minuta*. Von Schrenck observed it on the Schilka as early as the 19th of May; and one specimen obtained was then in winter dress. It is found on the Japanese island of Yezo; and it occurs throughout the Chinese coast in winter. It is probably by way of the coast of China that it strays as far south as Borneo, where it was obtained at Pagattan by Schwaner.

Turning westward to Europe, we find it recorded from Turkey by Herr Finsch; and in the south of the continent generally it is found during the winter. Professor Von Nordmann, writes Mr. Dresser, believes it to breed in the Crimea. Its true summer haunts are, however, the north of Russia, Lapland, and Scandinavia, whither it resorts in great abundance to nest, as we learn from Messrs. Seeböhm and Harvie Brown's experience on the Petehora, and likewise from the visit of the latter gentleman to Archangel. It is not so common in the west of Europe as the Little Stint, and is only a straggler to England, where it occurs chiefly in the autumn. Several examples have been obtained in the neighbourhood of Newcastle by Mr. Hancock, and among them one in summer plumage, shot on the 25th of May. It has once been found in Ireland, according to Mr. Dresser; but in Scotland it has not been noticed, although it ought to occur on the east coast *en route* to Norway. It is included in Mr. Smith's list of Portugal birds, although he did not observe it himself. Near Gibraltar it is common in winter, being, says Col. Irby, found in small parties of from six to a dozen or more. It has not been recorded from Morocco; but it no doubt occurs there, as it has been found down the west coast as far as Senegambia. It is met with in Algeria; and in Egypt and Nubia it is distributed throughout the country, but is not so abundant as the Little Stint. Von Heuglin states that it wanders south in winter as far as the Kordofan swamps and the White Nile, and is also to be found on the coast of the Red Sea, leaving for the north in April and May, although stragglers remain throughout the summer in that region.

Habits.—In its economy this pretty little Stint resembles the other members of the genus *Tringa*, and frequents the usual localities on the banks of tidal or large inland rivers, the margins of lagoons, salt marshes, and the sea-shore itself. Its flight is swift; and it has a singular habit of hovering in the air while breeding, which is not peculiar to any other of its congeners. Messrs. Alston and Harvie Brown speak of it as follows:—"It rises and hovers with raised wings about 15 feet from the ground, uttering at the same time a low trilling note. This habit was well known to our boatmen, one of whom, when he wished to indicate the species to us, would hold out his arms, vibrating the fingers, and imitating the cry of the bird to perfection." Col. Irby states that they are "tame and easy to obtain;" and this trait in their disposition is intensified during the breeding-season, for the charming fearlessness which they exhibit at this time has been the admiration of all who have visited their Arctic haunts. Mr. Dresser noticed, while observing them in Finland, that, in running about after insects, gnats, &c., on which they feed, "they moved with great activity, the head drawn rather close to the body; and when they rested for a moment they would, like many of their allies, move the head backwards and forwards several times. The note is shrill and cricket-like, but pleasant, and somewhat resembles the word *Tirrii* several times repeated."

Nidification.—In the north of Asia this species breeds on the Boganida, Yenesay, Ob, and Taimyr rivers,

on the lakes near the Arctic Ocean, on the islands in the river-deltas, and in the Stanowoi Mountains. Mr. Seebohm found a nest as early as the 24th of June on the Yenesay, and later on took its eggs on the islands of the delta in lat. $70\frac{1}{2}^{\circ}$ and $71\frac{1}{2}^{\circ}$. It is interesting to know (if Severtzoff is certain of the fact) that it breeds in the mountains of Turkestan; and should this be the case, it is just possible that *T. subarquata* breeds in Kashgar, as Dr. Scully was informed.

In Europe Mr. Dresser found it breeding in the Uleåborg Islands off Finland, and gives the following account of it:—"I spent the 12th of June on the islands outside of Uleåborg, looking for nests, and found one of this bird on Akkio Island. . . . It was situated near the middle of the island, some twenty or more yards from the shore; and being placed where the grass was thick, it was not seen till almost trodden upon. It was a mere hollow in the earth, such as might be made by working the large end of a hen's egg in soft soil, with small hay-straws neatly arranged round the inside, and contained four eggs, all placed with the pointed end towards the centre. Both birds were very fearless, and did not go from the nest, but every now and then flew up in the air and descended again in eircles, fluttering like a Skylark, uttering at the same time a peculiar churring sound, which they also emitted while sitting on any elevated place. A favourite perch of one of them was a pole which had been set up for a pilot's mark, but had been broken off about 8 feet from the ground; on this the bird would sit for a quarter of an hour at a time, churring all the time, and would allow me to approach within a few feet of it."

Mr. John Wolley, the celebrated oologist, in giving Mr. Hewitson an account of its nesting, which was published in the latter gentleman's 'British Birds' Eggs,' also speaks of this Stint's interesting habits while rearing its young. He says:—"Nothing can be more interesting or pretty than this little bird in the early part of summer; it is so tame that one could often catch it in a net at the end of a stick. At one time it is hovering with its wings raised over its back, or floating about, and it reminds one rather of some insect than any other bird; at another time it may be standing on the top of a stone or stake, or the gable end of a cottage; and whether hovering or standing on its perch, it utters a constant trilling note, of which I can best give an idea by saying that it brought to my recollection the Grasshopper Warbler, though the resemblance is perhaps slight. When its eggs are very near, it sometimes runs about one's feet, and, though it cannot but be anxious, it seems as busy as ever, picking gnats and other insects off the grass."

The eggs are four in number, and vary very much in ground-colour; a large series in Mr. Seebohm's museum now before me vary from greenish white to buff stone-colour, and also olive-grey, between which there are various shades of buff. The markings are usually rather small sharp-edged blots of deep brown, mixed with smaller specks of the same, chiefly gathered about the large end, but not confluent or in the form of a cap; and beneath them lie small spots of bluish grey. Some, however, have the large end tolerably covered with large blotches; but the markings on the rest of the egg, with one or two exceptions, are of the normal small size. In some of the buff eggs the blotches and spots are pale brownish red. The green eggs have the darkest colouring. As in other Waders, the markings take a diagonal direction round the middle of the egg. They are pyriform in shape, and range in dimensions between 1.15 and 1.04 inch in length, and 0.81 and 0.78 respectively in breadth.

Subgenus LIMICOLA.

Bill very high at the base, then suddenly flattened and depressed to the tip, which is bent down in both mandibles; gonys ridged; a fine groove adjacent to the edges of both mandibles; nostrils oval and oblique, placed in a depressed membrane. Otherwise as in *Tringa*; the hind toe a little longer.

LIMICOLA PLATYRHYNCHA.

(THE BROAD-BILLED STINT.)

Numenius pygmaeus, Lath. Ind. Orn. p. 713 (1790, *nec* Linn.).

Tringa platyrhyncha, Temm. Man. d'Orn. ii. p. 616 (1820); Gould, B. of Eur. iv. pl. 331 (1837); Blyth, Cat. B. Mus. A. S. B. p. 269 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 692 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 49 (1864); Holdsw. P. Z. S. 1872, p. 474; Von Heuglin, Orn. N. Ost-Afr. ii. p. 1185 (1873); Hume, Str. Feath. 1873, p. 244, et 1874, p. 298; Armstrong, *ibid.* 1876, p. 343; David & Oustalet, Ois. de la Chine, p. 470 (1877).

Tringa pygmaea (Lath.), Von Middendorff, Sibir. Reise, ii. p. 223 (1853).

Limicola platyrhyncha (Temm.), Salvadori, Ucc. di Born. p. 222 (1874); Dresser, B. of Eur. pt. 51, 52 (1876); Hume, Str. Feath. (B. of Tenass.), 1878, p. 461; Hume, *ibid.* 1878, vii. p. 487; *id.* *ibid.* 1879, viii. (List of Ind. B.), p. 113.

? *Limicola sibirica*, Dresser, P. Z. S. 1876, p. 674.

Le plus petit des Courlis, Sonn.; *Pygmy Curlew*, Lath.; *The Broad-billed Sandpiper* of some.

Adult female (Ceylon, Feb. 21, 1879). Length (from skin) 6·4 inches; wing 4·2; tail 1·8; tarsus 0·85; hind toe and claw 0·78; bill to gape 1·28.

Note. The bill is flattened in this species, and bent down at 0·3 inch from the tip.

Adult male (Öland). Length (from skin) 6·5 inches; wing 4·3; tail 1·8; tarsus 0·8; middle toe and claw 0·8; bill to gape 1·2.

Iris brown; bill black, slightly pale at the base beneath; legs brown.

Winter plumage (Ceylon). Head, hind neck, and back grey-brown, the centres of the feathers darker than the edges; lower back, rump, and centre tail-feathers brownish black, with pale tips to the feathers; scapulars tipped with white, and with black shaft-streaks; least wing-coverts brown, finely edged with greyish; median and greater coverts blackish at the centre, then paling into grey, with deep margins of white; primaries and secondaries blackish brown, with whitish shafts; primary-coverts blackish; remaining tail-feathers greyish brown, the inner webs pale, that of the lateral feather almost white.

Lores dark grey, surmounted by a broad white stripe starting from the bill (where it confines the brown of the forehead into a point) and passing over the eye; cheeks and ear-coverts streaked finely with brown; beneath, from the chin to the under tail-coverts, white; under wing-coverts white; feathers beneath the metacarpal joint edged with brown; sides of the neck streaked with brown.

An example from China (24th November) has the superciliary bands less conspicuous, the face more streaked with brown, and likewise the chest slightly striated.

Summer plumage (Öland, 24th May).—*General character.* Head, back, and scapulars margined with dark rufous and white; top of head, occiput, lower hind neck, back, scapulars, and tertials deep black, most of the feathers edged with rufous, and the scapulars and interscapulars with broad lateral white margins; hind-neck feathers edged

with greyish, as in winter; lower back dull black; upper tail-coverts and four central tail-feathers deep black, tipped with rufous; feathers at the side of the rump and the lateral covert-feathers broadly margined with white; quills darker than in winter; lores and a broad stripe passing under the eye and over the ears black-brown; chin white; feathers of the face, fore neck, and its sides blackish grey in the centre, and broadly edged with white, the black centres set off above with rufous; beneath, from the chest, pure white, as in winter. An example from Amoy (wing 4.45 inches) is more broadly edged with rufous than the above; but this colour is confined to the same parts.

Young, in down (Muonioniska). "A narrow stripe from the base of the upper mandible, widening towards the centre of the crown until it covers the whole hind crown, black tinged with chestnut, and on the hind crown spotted with white; upper parts generally black, minutely spotted with white, and marked with chestnut on the sides; sides of the head and fore crown and underparts white, tinged with buff on the throat; a black patch before the eye, below which a black line passes along the side of the head to the nape." (*Dresser.*)

Obs. The eastern form of this Stint inhabiting China differs slightly from the western and European bird in having more rufous on the upper surface, the edgings of the head- and back-feathers being broader and brighter than in typical *Limicola platyrhyncha*. Mr. Dresser has consequently separated it under the name of *L. sibirica* (P. Z. S. 1876, p. 674). I see but little difference in Chinese examples I have examined and the one above described, and I scarcely think the eastern form worthy of separation. The distribution of colour is the same, simply intensifying as the bird ranges to the eastward. In winter he says it cannot be separated easily from the European form, though it appears to him a trifle paler, and somewhat longer in the wing and tarsus. Mr. Hume's measurements of fifteen specimens from India and Burmah vary in the wing from 3.9 to 4.35 inches, and in the tarsus from 0.85 to 0.94. In this series, some of which might be supposed to belong to the eastern form, the length of tarsus does not always correspond with that of the wing; for example, there is a ♂ (Kurrachee), wing 3.9 inches, tarsus 0.85; ♂ (Andamans), wing 4.32, tarsus only 0.88.

Distribution.—This curious Stint is a rare straggler to Ceylon, and has only been, to my knowledge, procured on two occasions. Layard obtained two specimens at Point Pedro; and Mr. S. Bligh writes me that he met with a few this last cold season in the Yāla district, and shot a female (the specimen now before me) on the 21st of February last (1879). It was met with at the upper end of the large salt lagoon behind the town of Hambantota, and was in company with some Curlew- and Little Stints. It is probable that limited numbers, perhaps more in some seasons than others, visit Ceylon; but they naturally remain unnoticed amidst the myriads of Stints that yearly come and go.

In India, being a sea-coast bird almost entirely, its numbers are not nearly so great as those species already noticed, and it is, according to Jerdon, rare in the south. Regarding all the notices of Broad-billed Stints in 'Stray Feathers' to apply to the western form, we have Mr. Hume recording *L. platyrhyncha* as rare in the Calcutta district, half a dozen specimens being all he noticed in the market in as many years. In the Irrawaddy delta Dr. Armstrong says that it is "excessively common throughout the entire district lying between the mouth of the Rangoon river and China Bazaar. It was also common along the margins of all the creeks and nullahs in the vicinity, extending up the Rangoon river as far as the junction of the latter with its Pegu tributary." In Tenasserim it is only a straggler; the same gentleman procured it once at Amherst, but Mr. Davison never met with it. At the Andamans it is likewise rare, for Mr. Davison only met with a few associating with a small flock of *Tringa minuta*. It was not seen at the Nicobars. It has been obtained in Java by Reinhardt, and doubtless wanders occasionally to Sumatra down the Malay Peninsula. Salvadori records it doubtfully from Borneo; and I am not aware that it has been seen in any other island in Malasia. It is probable that all these Malay birds belong to the so-called eastern form obtained in China, Hainan, and Formosa by Swinhoe.

In regard to North-west India, Mr. Hume states that it is very common in the Kurrachee harbour and along the Mckran and Sindh coasts; but he has no evidence of its being found anywhere inland, for in an examination of the great rivers of Upper India he never saw a specimen in the "Central Provinces, Oudh, Behar, the North-west Provinces, Rajpootana, or Sindh above Kotree;" nor has he ever met with a specimen in numerous collections from those provinces. We may therefore conclude, as it is not recorded from the Deccan nor by Mr. Ball from the Godaveri-Ganges district, that it is purely a littoral form.

Severtzoff did not observe it on passage in Turkestan, nor do Messrs. Stoliczka, Scully, and Henderson record it from Kashgar. Mr. Seebohm did not meet with it on the Yeuesay; even in Western Siberia it was not the lot of Dr. Finsch, in his extensive travels, to see it; so that we may conclude that, as far as Indian birds are concerned, those in the north-west pass by way of Persia, Arabia, and Palestine into Europe, and those in the eastern parts (Burmah, &c.) migrate to North-east Siberia, where Middendorff found it on the Sea of Okhotsk. Neither Schrenck nor Prjevalsky met with it, and it is not recorded from Japan. In China Swinhoe says that it is found in winter, as also in Formosa; and Père David remarks of it that, though frequent in Formosa, it is only found in small numbers on the coast of China; he observed some examples in the Shanghai market in April and May. It has not been met with hitherto in the Philippine Archipelago; but it ranges south probably along the Siam coast into the Malay Islands, for Reinwardt procured it in Java, and Salvadori records it, though doubtfully, from Borneo.

In Europe it is confined to the north in the breeding-season, and is found on passage in the south-east and as far west as Belgium, where it has been obtained on the Meuse. In Germany it occurs rarely on passage, and is more often seen in spring than autumn. On the northern coasts of France it is met with, says Mr. Dresser, at irregular intervals, and is found on the south coast as well. Mr. Goebel and Professor von Nordmann record it from the neighbourhood of Russia. It occurs but rarely in Sicily. Messrs. Elwes and Buckley record specimens as having been obtained on the Bosphorus by a Mr. Robson.

As regards its breeding-habitat: it was found nesting in Norway and Lapland, north of 58°, by Messrs. Collett and Wolley; and it occurs in the Archangel district also in summer. Though it breeds in the north of Sweden and Norway, it is met with only on passage in the autumn in the south of Scandinavia, as also in Denmark and in the islands near Rügen. It is rare in Germany, being chiefly seen during the spring migration. As it is not found in Spain, it would not, as a matter of course, occur in Morocco; and I find no reference of its having been obtained in Algeria. In Egypt Capt. Shelley does not seem to have met with it; but Von Heuglin shot it once near Suez in August, and believes that he saw small flocks in September near Ras-Belul, on the African coast of the Red Sea; he states that Hedenborg procured it in Egypt; but from these few occurrences it is evident that it is not a regular visitor to this region. That it passes rarely down the east coast of Africa is proved by its having been procured in Madagascar.

Habits.—This fine Stint frequents the mud banks on the borders of tidal rivers, and the sands and ooze on shores and lagoons respectively, and appears to be almost more restricted to the vicinity of the sea-coast than any other of the more common members of its genus. It is found in small parties of less than half a dozen in number or singly, and associates with the Little Stint and other small congeners. I have never had an opportunity of seeing it alive; but Von Heuglin informs us that it resembles the Dunlin in its carriage, actions, and flight, and that when on the wing it goes in tolerably close company. Mr. Dresser, who observed it off the coast of Uleåborg, in Finland, writes that it resembles the Jack Snipe in its flight: of its note he cannot speak, as he did not hear it; but I should say it probably resembles that of other Stints. In the breeding-season, according to Mr. Wolley, it makes a faint twittering noise.

Nidification.—In Europe this bird has been found breeding in Lapland, and in Norway on the Dovrefjeld. The situations chosen are, writes Mr. Wolley, "open soft places on the marsh where there is little else than bog-moss with a light growth of a kind of sedge; and on a low tuft just rising above the water its nest may be found, often without much difficulty. . . . Many empty nests may be found for one that is occupied; and I suppose them to be nests of former years; for the moss in which they are usually worked long retains any mark made in it, being hard-frozen for more than half the year. They are neatly rounded hollows, and have a few bits of dry grass at the bottom. The bird sometimes flies and sometimes runs off her eggs; and if she has sat for a day or two she will come back even whilst men are standing all around."

Mr. Mitchell, who found it nesting on the Dovrefjeld, writes to Mr. Alston some interesting notes, which I extract from Mr. Dresser's 'Birds of Europe':—"It is rather curious to notice how the lining of the nest is suited to the colour of the eggs. The darkest ones are laid on the brown withered leaves of the mountain-willow, while one nest, the eggs of which were as light as Dunlins', was lined entirely with grass; several others were mixed with it. . . . The nests are more elaborate than most of the Sandpipers', scratched deeper down,

and more carefully lined. The old bird sits so closely that she never gets off until your foot is nearly upon her." The eggs are laid from about the middle of May until the middle of June. They were beautifully figured some years ago by Mr. Hewitson, and are very remarkable, inasmuch as some are of a type quite abnormal for a Wader. These have the appearance at a distance of almost uniform chocolate-brown; they are of a yellowish-stone ground, but so thickly stippled with chocolate-brown that the surface is almost completely covered with this colour. Others are of a dusky yellow ground, more openly stippled and speckled with chocolate-brown, intermixed with a few streaks of black, and are scarcely less dark in character than the first-named. Some, again, are olivaceous stone, spotted numerously with dark clear brown (lighter in some than in others), under which are bluish-grey spots. Others, again, are greyish stone-colour, handsomely blotched throughout with irregular and broken markings of dark sepia over spots of bluish grey and clouds of light greyish brown, and intermingled with streaks or scratches of blackish brown. Two eggs in the fine series before me, taken in Lapland, and in the possession of Mr. Dresser, are of the chocolate type, with bolder markings round the large end than in the first-mentioned. Examples measure 1.23 by 0.92 inch, 1.23 by 0.87, and 1.34 by 0.88.

Genus STREPSILAS*.

Bill rather short, conical, wide at the base; the tip acute and the culmen flattened at the base, and slightly upturned from the nostril to the tip; nostrils linear, placed in a depression; gonys pronounced. Wings long and pointed; the 1st quill the longest. Tail moderately short, cuneate, of 12 feathers. Legs rather short; the tarsus protected with transverse scutes, and not longer than middle toe with its claw. Toes divided to the base, but bordered by a narrow membrane; outer toe scarcely longer than the inner; hind toe well developed; nails straight.

* I place this remarkable genus among the Scolopacidae, of which it appears to be an aberrant form, resembling the Stints in its deportment, actions, and many of its habits, but differing from them in the peculiar structure of its bill, and partly in its mode of feeding. Its change of plumage in the breeding-season is somewhat analogous to that of the *Tringa*, and its egg is purely *Scolopacine*. It has been erroneously placed by many in the family of Sea-Plovers (Hematopodidae), owing to the structure of its bill; but this organ is most variable and perplexing both in the Scolopacidae and Charadriidae, and consequently unsafe as a basis of classification; and the bird has nothing whatever in common with the Oyster-catchers.

STREPSILAS INTERPRES.

(THE TURNSTONE.)

Tringa interpres, Linn. Syst. Nat. i. p. 248 (1766).

Strepsilas interpres (Linn.), Ill. Prod. p. 263 (1811); Gould, B. of Eur. iv. pl. 318 (1837); Jerdon, Madr. Journ. 1840, xii. p. 211; Gould, B. of Austr. vi. pl. 39 (1848); Blyth, Cat. B. Mus. A. S. B. p. 271 (1849); Middendorff, Sibir. Reise, ii. p. 213 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Jerdon, B. of Ind. iii. p. 656 (1864); Schlegel, Mus. P.-B. *Cursores*, p. 43 (1864); Finsch & Hartl. Fauna Centr.-Poly. p. 197 (1867); Swinhoe, P. Z. S. 1871, p. 408; Holdsw. P. Z. S. 1872, p. 472; Buller, B. of New Zeal. p. 221 (1874); Salvadori, Uccelli di Born. p. 320 (1874); Dresser, B. of Eur. pt. 35, 36 (1875); Legge, Ibis, 1875, p. 401; Irby, B. of Gibraltar, p. 163 (1875); Le Messurier, Str. Feath. 1875, p. 380; Hume, *ibid.* 1876, p. 464, et 1879, viii. (List B. of Ind.), p. 112; David & Oustalet, Ois. de la Chine, p. 433 (1877); Feilden, Ibis, 1877, p. 405.

Charadrius cinclus, Pall. Zoogr. Rosso-As. ii. p. 148 (1831).

Cinclus interpres (L.), Layard, B. of S. Afr. p. 301 (1867); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1037 (1873); Hume, Str. Feath. 1873, p. 233, et 1874, p. 292.

Le Coulon chaud, D'Aub. Pl. Enl. p. 856; *Le Tourne-pierre*, Buffon; *Steinwältzer*, German. *Kotan*, Ceylonese Tamils; *Kiojo-shigi*, Japan; *Kuling*, Pelew Is.; *Pimpeng*, Borneo.

Adult male and female (Ceylon). Length 8.0 to 9.6 inches; wing 5.9 to 6.4; tail 2.5 to 2.7; tarsus 0.95 to 1.05; middle toe and claw 1.0 to 1.1; hind toe 0.2; bill at front 0.8 to 0.97, to gape 1.03 to 1.07.

Females average larger than males; in the above series 6.0 inches is the largest male wing-dimension.

Iris brown; bill black; legs and feet light orange-red; joints of feet dusky; claws blackish.

Male, breeding-plumage (Norway, 15th June). Back, rump, base of tail, body beneath from the chest, together with the under wing, pure white; forehead, cheeks, sides of the neck, fore neck, chest, and lower part of the hind neck jet-black—the black forehead is joined to the cheeks by a stripe passing underneath the eye; lores, above the black forehead and over the eye, the ear-coverts, chin, and centre of the throat pure white; crown and nape black, with broad white edges to the feathers, the white predominating on the nape and hind neck, and passing in a broad band on each side towards the chest; some of the lower hind-neck feathers, most of the scapulars, and the median wing-coverts cinnamon-red; terminal portion of many of the scapular-feathers greenish black; least wing-coverts, winglet, primary-coverts, and quills blackish brown; greater wing-coverts white, with a black patch on the outer webs; shorter primaries with a white patch near the base of the outer web; primary-shafts whitish; underlying scapulars and a tuft of feathers next them on the bend of the wing pure white; a band of black across the middle of the upper tail-coverts; terminal portion of tail black; outer tail-feathers white, with a black spot near the tip, the adjacent feathers tipped with white.

Male, winter (Ceylon). Black bands of the forehead, cheeks, and face, as also the black of the sides of the neck, chest, and breast, duller than in the summer dress, and most of the feathers tipped with white, detracting from the uniformity of these parts; the stripe from the cheeks to the lower mandible generally incomplete; the head and hind neck brown, the feathers edged pale, and the white of the forehead above the band obscured by brownish feathers; the ear-coverts brownish; the upper back and scapulars brownish black, some of the tertials and scapulars tipped with brownish rufous; the wing-coverts brown, with whitish edgings; the feathers of the upper part of the upper tail-covert band tipped with white.

In March, during moult, examples vary much in the white coloration of the face and head and the rufous of the back and wings; the tertials and greater wing-coverts generally show the rufous colour first.

Female, summer (Norway, June). Intermediate between the above-described specimens; the black markings of the head, neck, and chest are not so bold as in the male, and they are intermingled with a few white feathers; the rufous coloration of the scapulars, back, and wing-coverts is less in extent and obscured with brownish, shading into black on the centres of many of the feathers; the white loreal patch and the frontal band are not so well defined as in the male in summer, but not so obscured as in that sex in winter.

Young, nestling (three days old). Down "blackish grey, slightly washed with yellowish, and here and there tipped with black; along the crown a narrow black band reaching to the forehead, though not quite to the base of the bill; a similar stripe extends from the base of the upper mandible to the eye; and there is a black spot at the gape; sides of the throat grey; belly white; wings and scapulars coloured like the back." (*Dresser, fide Collett.*)

Immature, first autumn (25th September, Colombo). Back, rump, and under surface as in the adult female; head and hind neck brown, the feathers edged with fulvous; interscapular region and scapulars glossy brown-black, the latter tipped with whitish, and some of the feathers margined with rufescent buff; tertials and wing-coverts brown, edged with rufescent; cheeks whitish, patched with blackish brown next the throat, which, with the chin, is white; fore neck and chest brownish black, the feathers slightly margined with rufescent, and at the sides of the chest an obscure whitish fulvous-tinged black-tipped band; inner lesser wing-coverts next the white scapular-feathers white; tail-feathers tipped with rufescent grey.

Females in the second year (shot in spring) resemble the above in having the lores brown; but the wing-coverts and scapulars are tipped with greyish white, as are also the pectoral feathers, and there is more white at the bend of the wing.

Obs. In a series examined from Europe, Asia, America, and the Atlantic isles the measurements are:—wing 5·8 to 6·3 inches; tarsus 0·9 to 1·05; bill to gape 0·9 to 1·0. Mr. Hume records the weight of examples killed in Sindh as 3·75 to 4·3 oz. Vastly distributed almost over the entire universe as this species is, there is, however, another which shares with it the occupation of the northern shores of America; it is the *Strepsilas melanocephala* of Vigors. It has the head, neck, throat, interscapulars, and wings glossy brownish black, with the chin whitish brown, and the dark plumage of the fore neck pale-margined; the secondaries for the most part and a band on the wing-coverts extending out from the shoulders are white, as in the common species; back, base and tip of tail white, the terminal portion of the tail and a band across the rump black; under surface as in *Strepsilas interpres*. Examples from Vancouver's Island measure:—wing 5·8 to 6·2 inches; tail 2·4; tarsus 1·0; bill to gape 1·05.

Distribution.—The Turnstone is common on the north-west coast in suitable localities, as also in the Jaffna Peninsula; it appears to be rare on the opposite side of the island, as I have only seen it once or twice in the Trincomalie district, and that was near Foul Point. It was met with in the Kirinde and Hambantota district in March, but not in any numbers. On the west coast south of Chilaw it appears to be only a straggler. Layard met with it at Colombo; and I have seen young birds on the rocks of the Galle Buck on one occasion. In the north, in the month of March, I observed a few examples on the Pootoor lagoon, near Jaffna; small numbers at the entrance to the Jaffna lake; large flocks on the Erinativoe Islands, at Illipekadua, and on the Manaar flats; isolated individuals at Aripu; and considerable numbers at Karativoe Island. The majority leave the island in April; but Mr. Holdsworth has procured it in August at Aripu, the individual in question being no doubt a barren and non-migratory bird. I have also seen it at Chilaw. It frequents the coasts of India, but does not seem to be common north of Madras and at the head of the Bay; and on the Burmese and Tenasserim coasts it appears, curiously, not to have been observed. No one but Blyth has recorded it from the Calcutta district. Jerdon remarks that it is found on the rocky beds of large rivers, and states that he procured it in the Deccan more than 200 miles inland. Mr. Adam has likewise met with it in September at the Sambhur Lake, which is still further from the coast; but as the specimens he alludes to were observed in September, they were evidently birds on passage from the north. On the Laccadives it was the commonest bird in the group when Mr. Hume visited it; and in the Andamans and Nicobars it is widely distributed, though not abundant. It is recorded in 'Stray Feathers' as abundant in Kurrachee harbour in the cold season; and Major Le Messurier met with it on Baba Island, off the Sindh coast, in August. It has been observed on the Mekran coast; and in the Gulf of Oman Capt. Butler saw it in May; he likewise states that it is to be seen at Kurrachee in the hot weather. It is probably found on all the islands of the Indian

Ocean. It inhabits the Comoro Islands; and Mr. Newton observed it in the Seychelles at Curieuse, and also on the island of Rodriguez in September; he likewise met with it in Madagasear, on the east coast, in the same month; and from this island it is also recorded by Messrs. Sehlegel and Hartlaub.

It migrates across the continent of Asia to the extreme north of Siberia; but does not seem to have been noticed on the Ob or Yenesay. On its passage to Northern Asia it occurs in the north-west of Turkestan, and likewise traverses the highlands of Kashgaria, where it was met with in September by Dr. Henderson near Yarkand. On the Taimyr river, in lat. $73\frac{1}{2}^{\circ}$, it was seen by Von Middendorff; he found it breeding there, and noticed that it had left that region by the 10th of August; he also saw it on the Boganida, and in the sea of Okhotsk met with it on Shantar Island. Dr. Dybowski says that it is not uncommon during migration in Kultuk. It is found in Japan, and is pretty common on the mainland, being also met with in Yezo. It does not seem to pass over the Mongolian territory on its way south in winter; and probably this is the reason why it is so scarce on the Burmese coasts. It is, however, found on the shores of China in winter, and visits Formosa and Hainan; in the latter island Mr. Swinhoe found it in large numbers in March on the Poochin river. It does not seem to have been noticed in the Philippines; but it has evidently been passed over there, as it is found in the Pelew group, further east; and it has recently been obtained in the Admiralty Islands by the 'Challenger' naturalists. It is distributed throughout all the Malay archipelago, having been recorded from Borneo by several explorers, and also from Java, Banka, Timor, Ternate, Halmahera, Morotai, Ceram, and Celebes, in which latter island Dr. Meyer procured it in March. The large island of New Guinea is, as a matter of course, visited by it; and from Torres Straits Gould records it in full summer plumage; so that it is possible it may breed on some of the islands of the archipelago. It is found all round the coasts of Australia, extending to Tasmania. In New Zealand it was obtained in 1870 on the Ninety-mile Beach; and since then Dr. Haast and Captain Hutton have procured it, in the latter case in summer plumage. It is found in New Caledonia; and recently Layard records it from Viti Levu and the island of Koro, in Fiji. Mr. Leopold Layard also believes he saw it in the New Hebrides, from where Gray records it, as well as from Aneiteum. It has been obtained in the Samoa, the Viti, the Saudwieh, and the Marianne groups, as also in the islands of Ponape and Niafou, and doubtless occurs throughout all Oceania.

Turning towards Europe, as regards its distribution in which I have space only for an outline, we find that it is common on the shores of the Caspian, a spring and autumn visitor on the coasts of the Black Sea and the sea-board of Greece, an occasional visitor to Turkey, that it appears irregularly in Malta and Gozo, occurring there in May, August, and September, a bird of passage in Sardinia and Sicily (in the former during the spring chiefly), and also that it is found in the Balearic Islands, in which Von Homeyer was informed that it bred. It is said to be rare in Italy. Looking towards the north of Europe, we find that it is a bird of passage in Belgium, and that it occurs chiefly in winter in Holland. In Denmark it arrives in spring and breeds in many localities; and northward of this it is found more or less commonly on the shores of the Baltic, in the Gulf of Bothnia, on the coasts of Scandinavia and Northern Russia, extending to Nova Zembla, where Von Baer met with it; and further north still to Spitzbergen, where Professors Newton and Malmgren observed it in the month of July, and whence there is a specimen in the Stockholm Museum, procured by the collectors of the latter gentleman. It has also been observed in Central Russia during migration. In Great Britain it is common in spring and autumn; and on the west coast of Scotland it is seen as late as June, reappearing in August; and it is believed to breed in the Shetlands and Hebrides. In the Faroes Capt. Feilden found it in pairs in June; and it very probably breeds in these islands, although he was unsuccessful in finding its eggs. It is common in Iceland from April until autumn; but it was also obtained by Faber there in December. It breeds both in North and South Greenland, and was obtained on Sabine Island by the last German Arctic expedition. During the expedition of 1875-76 Captain Feilden writes that it was found tolerably abundant in Smith Sound, and was observed as late as 5th September in lat. $82^{\circ} 30'$; it was first noticed on the 5th of June near the winter-quarters of the 'Alert,' and by the 12th of August the young broods were able to fly. Returning to Europe, we are told that it is tolerably numerous on the coasts of France in autumn, but rare on those of Portugal; and in the south of Spain Col. Irby has observed it in spring and autumn. According to Favier it is found in Tangier in September and February, and occurs sometimes on freshwater lakes. It occurs in Algeria during migration, and has been recently obtained at Damietta in Egypt. Von Heuglin met with it on the Red Sea in May and July; and it likewise breeds there, as he saw

young and old birds at Ras Belul in September, and observed the species on the east coast of the continent as far south as Zela and Berbera. Vierthaler also met with it on the White Nile. It extends southwards along the whole coast to Mozambique and Zambesi; and at the Cape is resident, Layard believing that it breeds there. Up the south-west coast it is not uncommon, and has been observed at various places northward to the Gold Coast. Between this and Moroeo it does not seem to have been met with. In the Canaries, the Azores, and Madeira it is not uncommon; and Mr. DuCane Godman believes that it breeds in Flores and probably in the Canaries, in which latter islands Dr. Bolle says it is a constant resident, he being also of opinion that it must breed in some of the group.

As regards the range of the Turnstone in the New World, Mr. Dresser writes:—"On the American continent the distribution of this species is almost equally wide, as it is found from the Hudson's-Bay Territory down to the southern portion of South America. Capt. Blakiston states ('Ibis,' 1863, p. 130) that he received several specimens from York Factory, where he observed it in August; and in the 'Fauna Bor.-Am.' Mr. Ross gives it as a rare bird on the Mackenzie. On the east coast of North America I observed it on the shores of the Bay of Fundy, where, however, it is rare. It is met with during the seasons of migration, or in the winter, on the shores of eastern North America in tolerable numbers. Mr. Elliott Coues says that in North Carolina it is very common during migration, and some winter there." Mr. Dresser himself met with it in Texas, procuring it in June at Galveston. He further adds:—"On the west coast it was met with by Messrs. Dall and Bannister in Alaska, where, Mr. Dall says, it was not common at the mouth of the Yukon; and, according to Dr. Finckh, it was obtained in Amachnak, near Unalasehka, at the end of August, by Von Kittlitz. Southward it is met with as far as Chili." In the latter it was obtained by the 'Novara' expedition; and Dumon procured it in Peru, as well as in the Galapagos Islands. Mr. Salvin states that it inhabits both coasts of Guatemala; and Mr. Lawrence says that it was obtained in Mexico on the Rio Zacaatula. In the Bahamas it has been met with in April, and it has also occurred in Bermuda. Gosse observed it in Jamaica; and in Cuba it is stated by Dr. Gundlach to be common from September till May. In the island of St. Croix Professor Newton met with it in April, and Mr. E. Newton in September.

Habits.—As will be gathered from its distribution above sketched, this interesting bird is purely a littoral species, rarely being found away from the sea-shore, except during the course of its migration. It frequents the sandy shores of the vast area of the globe just referred to, and subsists on small sand-worms, sand-flies, and other marine insects and their larvæ, as well as tiny crustaceans and minute shells, which it swallows whole, and which it is said in a great measure to find beneath pebbles, stones, large shells, pieces of seaweed, dead fish, or any other substance lying on the beach, and turned over by it with its upcurved bill. In Ceylon I have found it on the pebbly sand flats on the north-west coast, about the beaches of the islands, and sometimes at the edge of the ooze just after the ebb of the tide, or, again, on the margins of shingly lagoons near the shore in the south-eastern district. It is frequently noticed singly or in small parties of three or four, as well as in considerable flocks, which feed in scattered company, and consort with the Mongolian Sand-Plover, the Curlew- and the Little Stint. It is a very elegant bird in its actions and deportment, running swiftly, then suddenly stopping and pecking down among the pebbles, its small head and well-proportioned frame forming a graceful outline against the foaming tide. It cannot be called a very shy bird, though it will not permit a very near approach, generally rising when one is within 50 or 60 yards of it. Its flight is swift and strong; its long-pointed wings are beaten rapidly, and then often extended for an instant, when it will glide along for some little distance and then resume its course, flying generally low. It has been recently proved that it swims about a good deal. Mr. Hume writes of it in the Laccadives as frequently swimming outside the breakers surrounding the reefs there. He remarks that "they rose out of the water with the greatest ease, took short flights, and dropped down again into the sea, in which they appear to be perfectly at home." It likewise perches on elevated objects, thus showing its affinity to the Sandpipers. Swinhoe writes that in Hainan "they sat on the fishing-stakes, and ranged themselves in rows on the ropes that ran from stake to stake." In the Andamans also Mr. Davison observed them sitting on the gunwhales of "boats, in company with the Common Sandpiper." I have never observed them turning over stones in search of food, but have only noticed them picking it up in the ordinary way. Audubon, however, has seen them turning over oysters and clods of mud, and relates that "whenever the object was not too large the bird bent its legs to half their length, placed its bill

beneath it, and with a sudden quick jerk of the head pushed it off, when it quickly picked up the food which was thus exposed to view, and walked deliberately to the next shell to perform the same operation." The most remarkable instance of the skill and instinct of the Turnstone that has yet been published is that of the scene witnessed on the Banffshire coast by the Scotch naturalist, Thomas Edwards, whose life has lately been written by Mr. Smiles. The first account appeared in the 'Banffshire Journal' of Dec. 31, 1850, and it afterwards reappeared in the 'Zoologist' for April 1851. Having noticed a pair of small shore-birds engaged with some large object on the beach, Edwards, with his wonted enthusiasm, crept into a hollow in the shingle which was close to the birds, and was thus enabled to minutely scrutinize their actions. I transcribe here a portion of the interesting narrative of what he saw from the book in question; and I doubt not that in the main particulars it is a faithful account of what happened, as Audubon testifies to the birds using their breasts in pushing over heavy objects:—

"Having got fairly settled down in my pebbly observatory, I turned my undivided attention to the birds before me. They were boldly pushing at the fish with their bills, and then with their breasts. Their endeavours, however, were in vain: the object remained immovable. On this they both went round to the opposite side, and began to scrape away the sand from beneath the fish. After removing a considerable quantity, they again came back to the spot which they had left, and went once more to work with their bills and breasts, but with as little apparent success as formerly. Nothing daunted, however, they ran round a second time to the other side, and recommenced their trenelling operations with a seeming determination not to be baffled in their object, which evidently was to undermine the dead animal before them, in order that it might be the more easily overturned.

"While they were thus employed, and after they had laboured in this manner at both sides alternately for nearly half an hour, they were joined by another of their own species, which came flying with rapidity from the neighbouring rocks. Its timely arrival was hailed with evident signs of joy. I was led to this conclusion from the gestures which they exhibited, and from a low but pleasant murmuring noise to which they gave utterance so soon as the new-comer made his appearance. Of their feelings he seemed to be perfectly aware, and he made his reply to them in a similar strain. Their mutual congratulations being over they all three set to work, and after labouring vigorously for a few minutes in removing the sand, they came round to the other side, and, putting their breasts simultaneously to the fish, they succeeded in raising it some inches from the sand, but were unable to turn it over. It went again into its sandy bed, to the manifest disappointment of the three. Resting, however, for a space, and without leaving their respective positions, which were a little apart the one from the other, they resolved, it appears, to give the work another trial. Lowering themselves, with their breasts close to the sand, they managed to push their bills underneath the fish, which they made to rise about the same height as before. Afterwards withdrawing their bills, but without losing the advantage which they had gained, they applied their breasts to the object. This they did with such force and to such purpose that at length it went over, and rolled several yards down a slight declivity. It was followed to some distance by the birds themselves before they could recover their bearing.

"They returned eagerly to the spot from whence they had dislodged the obstacle which had so long opposed them; and they gave unmistakable proof, by their rapid and continued movements, that they were enjoying an ample repast as the reward of their industrious and praiseworthy labour. I was so pleased and even delighted with the sagacity and perseverance which they had shown, that I should have considered myself as guilty of a crime had I endeavoured to take away the lives of these interesting beings at the very moment when they were exercising, in a manner so happily for themselves, the wonderful instincts implanted in them by their Creator. When they appeared to have done and to be satisfied I arose from my place of concealment. On examining the fish I found it to be a specimen of the common cod. It was nearly three feet and a half long, and it had been imbedded in the sand to the depth of about two inches."

The note of the Turnstone resembles somewhat that of some Sand-Plovers, and is a lively-sounding *keēt-e-krek, keēt-e-krek*, twice repeated.

Nidification.—The Turnstone breeds in June, resorting to islands or lonely spots on the shores of the mainland in northern latitudes where the soil is sandy and interspersed with bushes, small shrubs, or broad-leaved plants scattered about, under which it often makes its nest. This is said to be a depression in the soil

sometimes sparingly lined with a few grass-bents or roots mingled with, perhaps, one or two dead leaves. The eggs are four in number, and thoroughly Scolopacine in shape and markings, having nothing whatever in common with Sea-Plover's eggs. They are pyriform, and for the most part compressed near the small end; the colour is clayey buff, olivaceous stone, or brownish stone, and the markings, which are in all thickly gathered round the large end, are longitudinal, oblique-running, smeary blotches of umber-brown and olive-brown of one or two shades (in some eggs darker than in others) over clouds, smears, and spots of bluish grey; the smaller half of the egg is boldly marked, but the blots are more circular and are intermingled with small specks. An egg in a fine series of Mr. Seebohm's, before me, is closely spotted or freckled throughout with several shades of brown, and in another the markings are brownish red. In size they vary from 1.52 to 1.7 inch in length by from 1.06 to 1.15 in width. The late celebrated oologist Mr. Hewitson, together with Mr. J. Hancock, were the first naturalists to bring the eggs of the Turnstone to England in the autumn of 1833.

Genus NUMENIUS.

Bill very long, slender, rounded, and curved as a sickle throughout; tip obtuse, projecting over the under mandible; mandibles grooved, the upper for three quarters of its length, the lower for half; nostrils linear and near the commissure. Wings long, the tertials exceeding the primaries; 1st quill the longest. Tail moderate, cuneate. Legs stout, moderately long. Tarsus covered with narrow transverse scutes below, and polygonal ones above; toes webbed at the base and margined by a narrow membrane; hind toe moderate; claws dilated.

The exterior notches on the sternum are wide and deep, and the interior narrow and pointed, the dividing "process" branching outwards.

NUMENIUS LINEATUS.

(THE EASTERN CURLEW.)

Numenius lineatus, Cuv. Règ. An. 2nd ed. i. p. 52 (1829); Blyth, Ibis, 1867, p. 167; Swinhoe, P. Z. S. 1871, p. 410; Hume, Str. Feath. 1873, p. 237; Adam, *t. c.* p. 396; Hume, *ibid.* 1874, p. 296; Butler & Hume, *ibid.* 1876, p. 16; Armstrong, *t. c.* p. 341; Hume, *t. c.* p. 464; David & Oustalet, Ois. de la Chine, p. 457 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; Davidson & Wender, *ibid.* 1878, vii. p. 89; Hume, *ibid.* 1879, viii. (List of Ind. B.), p. 112.

Numenius arquatus (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 268 (1849); Kelaart, Prodromus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 264; Jerdon, B. of Ind. iii. p. 683 (1864); Schlegel, Mus. P.-B. *Scelopaces*, p. 85 (1864, in part); Layard, B. South Afr. p. 322 (1867); Holdsw. P. Z. S. 1872, p. 474; Legge, Ibis, 1874, p. 29; Salvadori, Uccelli di Borneo, p. 332 (1874); Legge, Ibis, 1875, p. 402.

Numenius major, Temm. & Schlegel, Fauna Japonica, pl. 66 (1847); Blakiston & Pryer, Ibis, 1878, p. 222.

Courlis à taches étroites de l'Inde, Cuv.; *Grey Curlew*, of some. *Goar*, *Goungh*, Hind.; *Choppa*, Bengal., also *Sada Kastachura* (Jerdon); *O-shakushigi*, Japan; *Kutheraï Malle Kotan* (lit. "Horsehill Sandpiper"), Ceylonese Tamils.

Adult males (Ceylon). Length 22.5 to 22.9 inches; wing 11.0 to 11.9; tail 4.5 to 4.7; tarsus 3.2 to 3.4; middle toe and claw 1.9 to 2.05; bill at front, along culmen, 5.6 to 6.0. Dimensions of respective parts vary much; in this series the bird with the wing of 11.9 has the bill 5.6.

Adult female. Wing 12.0 inches; tarsus 3.5; bill at front, along culmen, 7.3.

As this species varies much in size, these limits are no doubt occasionally exceeded.

Iris brown; bill dark brown or blackish on the upper mandible, basal half of lower mandible fleshy white, tip generally paler brown than the upper; legs and feet bluish grey or leaden blue.

Head and hind neck with the feathers broadly centred with light sepia-brown, paling off at the edges, in some to greyish white, and in others to pale tawny, the edgings on the centre of the hind neck being always lighter than on the head, and passing round on the sides of the neck and fore neck, where the dark portions are reduced to narrow mesial lines; feathers of the upper back, scapulars, tertials, and wing-coverts centred with darker sepia-brown, paling at the edges to cinereous grey or greyish tawny on the back and scapulars, and to whitish on the wing-coverts; the greater coverts with indentations or marginal bars of white; quills dark brown, the inner webs barred mostly towards the base with white, the 1st primary with a white shaft, and all but the first four with white tips; lower back and upper tail-coverts white; the rump and uppermost of the coverts with mesial blackish stripes, the longer or underlying coverts with interrupted bars or central transverse spots; tail white, crossed with narrow wavy brown bands; lores and face brown-striped, a whitish band above the lores passing as a border round the eye; chin, gorge, and under surface white, the mesial lines of the fore neck continued on the breast, and widening into narrow drop-dashes towards the flanks; lower belly and vent unmarked; the under tail-coverts, axillary plumes, and sides of rump with narrow blackish shaft-lines near the tips; under wing-coverts white.

In some specimens the axillaries are pure white; and examples shot in Ceylon in March and April are more tinged with tawny on the back and flanks than mid-winter birds. A partial, if not a complete, moult takes place at this time.

Obs. I follow Messrs. Blyth, Swinhoe, and Hume in considering the Indian Curlew distinct from the European; but I only regard it as a *subspecies*, or well-marked Eastern-Asiatic form of that bird. It cannot be separated on account of the different or the variable curvature of its bill, for this is an utterly unreliable character in these large Curlews; nor can dependence entirely be placed on the almost unspotted axillaries, though the

peculiar marking of these feathers accords well with that of the under surface and flanks, which I hold to be the main distinguishing characteristic. The Ceylonese, Indian, Chinese, Japanese, and, curiously enough, the South-African Curlews all differ from their European and Western-Asiatic relatives in having the stripes of the fore neck, chest, breast, and particularly the flanks in the form of narrow, clearly-defined shaft-lines, broader of course on the latter part than on the neck, but still not breaking up into bars or expanding into short and rather roundish drops, as in the true *N. arquatus*; the ground-colour of the neck and chest is always whiter than in the latter, and, as an accompaniment to the narrow stripes of the above-mentioned parts, the axillaries are almost pure white, having merely a narrow shaft-line near the tip, which in some specimens (probably old) is absent. In some European Curlews there is scarcely any marking, but what there is takes a transverse form and not a lineal one. I have examined a fine series of Chinese and Formosan examples collected by Swinhoe, and they are all of the *lineatus* type; only one specimen shows any trace of barring on the longer flank-feathers, and this is apparently an immature bird. Swinhoe unites the Japanese form, *N. major* of Schlegel, with the Chinese; and the latter author correctly considers it identical also with the Curlew found in South Africa. This Chinese series measure in the wing 11.5 to 12.5 inches, and in the bill to gape (straight) 6.25 to 7.0. South-African specimens in the British Museum are inseparable from Ceylonese, Chinese, and Indian birds: one example measures in the wing 12.0 inches, bill to gape (straight) 6.8; one from India, wing 11.75 inches, bill to gape (straight) 6.8. There is a specimen from Athens in the national collection which I cannot separate from our form, and there is no reason why it should not be found in such an intervening and somewhat eastern locality as Greece. Indian examples are of course identical with Ceylonese, as the latter migrate to the island by way of the Peninsula. Measurements, according to respective writers, are:—♀ (*Hume*), wing 11.6 to 12.0 inches, bill at front 6.8 to 7.25, weight 1 lb. 11 oz. to 1 lb. 14 oz.; ♂ (*Armstrong*), wing 11.1, bill from gape 5.2; ♀, wing 11.2, bill from gape 7.2; (*Jerdon*) wing 11 to 12½, bill at front 4.0 to 6.5. There is great variation in the bill, in the same manner as in the European bird.

N. cyanopus, Vieill., is the Australian representative of this Curlew, migrating northward into China and Amoor Land. The back and rump are brown, with fulvous edgings to the feathers; the underparts are fulvescent, lined as in the Indian bird, and the axillaries are *barred* with brown. Examples from Australia, including one from Port Essington, measure—wing 11.5 to 12.5 inches, bill to gape (straight) 6.5 to 7.2.

Distribution.—This fine bird, which, like other Waders, is a cool-season migrant to Ceylon, arrives in the island about the middle or end of September, but is not seen in any great numbers until the end of the following month. It is very abundant in the north of Ceylon, frequenting the tidal flats between the Jaffna following month. It is very abundant in the north of Ceylon, frequenting the tidal flats between the Jaffna islands in very large flocks, and is equally numerous down the west coast to Manaar. Great numbers likewise frequent the long shoal which runs out from the Erinitivoe Islands, and hundreds find a home on the extensive sands at the northern entrance to the Manaar channel. I have seen it on Karativoe Island and on the Puttalam Lake and near Chilaw, but south of this it is rare. It is occasionally seen at Negombo, and I believe occurs at suitable places down the west coast. I never saw it at Galle; but it is found at Matara, and further east in the Hambantota district it is not uncommon. Thence northwards it is found on all the estuaries, lagoons, and salt lakes on the east coast. It is tolerably abundant in the Trincomalie district, and occasionally wanders from Tamblegam to the Kanthelai tank. The Nilavele salt lake and the Peria-kerretje lagoon were favourite resorts of the Curlew when I was stationed at Trincomalie. Mr. Parker tells me that he has seen occasional individuals at the Madewatchiya tank, which is quite in the centre of the northern part of the island.

This Curlew is found all round the coasts of India and Burmah; and though it is chiefly a littoral species, it, notwithstanding, occurs on the larger rivers inland, and is likewise, according to Jerdon, found on marshes and lakes in the interior. I do not find it recorded from the Deccan by any observers but Messrs. Davidson and Wender, and they state that it is rare. It occurs on the Laccadives, but not so commonly as the Whimbrel. Mr. Hume procured it at two islets, Cardamum and Aueuttee. In the north-west it is abundant, affecting the rivers in the Punjab and the borders of the Indus; and in Sindh “is nearly equally common,” writes Mr. Hume, in the neighbourhood of all the larger inland pieces of water, as well as in the harbour and backwaters of its coast and of the Mekran coast.” It is very common in the tank-country of Guzerat, frequenting the edges of wheels in large flocks of two or three hundred, and it arrives there as early as July (*Butler*). It is equally numerous in Kattiawar and Kutch; and in Kurrachee harbour Capt. Butler has seen it all through the hot weather. In Jodhpoor Mr. Hume says it is rare; but on its eastern confines, at

the Sambhur Lake, it is, according to Mr. Adam, frequently met with in flocks of seven or eight. In the Calcutta district it is commoner at the beginning and end of the cold season than during the middle. In Burmah it is said to have been procured at Thayetmyo; and in the Irrawaddy delta it is extremely abundant, says Dr. Armstrong, both along the coast and on the eastern side of the estuary of the river. In Tenasserim it is pretty common along the coast and a little distance inland. Mr. Davison noticed that the majority left in April; but many remained during June, July, and August, and these must have been stationary non-breeding birds. In the Andamans it is not uncommon on the creeks along the shores, and was not observed by Mr. Davison after the 8th April; but Mr. Hume has received specimens, shot in August and September, from Pt. Blair.

This eastern form of Curlew ranges, according to Messrs. Schlegel and Swinhoe, from Japan (where it is the *N. major* of Temminck and the former author) down the coast of China and Formosa to Hainan, and thence into the Malay islands, where it has been found in Java, Sumatra, and Borneo. Mr. Swinhoe procured it in March in Hainan, and says that it was common in Hoehow harbour until the beginning of April. It has been obtained in Sumatra by Henrici, in Java by Kuhl and Van Hasselt, and in Southern Borneo by Crookewit, while in the Leyden Museum there is a specimen from Halmahera. As regards Central Asia, its distribution is not very well defined. Przevalsky speaks of it as *Numenius major*, and writes that it is common in South-east Mongolia from the end of March to the end of April, where it frequents the shores of small lakes and puddles in the burnt-out steppes. He found it breeding in the Hoang-ho valley, and noticed the first migrants arriving at Koko-nor on the 15th of March, at the end of which month numerous flocks of fifteen to twenty were seen together. At Lake Hanka they were rather common, arriving about the end of March, and some of them stopping to breed about the middle of April. In Amoor Land Schrenck seems only to have met with the southern species above referred to, and which he writes of as *N. australis*, Gould.

Concerning its range in Western Asia I am not prepared to speak. Swinhoe, on the evidence of the identity of the South-African form with the Indian, supposes that it is migratory in the cool season down the east coast of Africa from India; but Layard speaks of it as a stationary species in South Africa. It is probably this Curlew that passes through Turkestan, occurring rarely, according to Severtzoff, in the eastern portions of the country. Canon Tristram did not obtain specimens, though he saw them on the coast of Palestine; and the birds that he considered to be the European Curlew may have belonged to this form. I have not examined skins from Egypt or Abyssinia, and cannot speak as to their identity; but I have mentioned one Greek specimen above which is labelled Athens (whether correctly or not I cannot say). As regards South Africa, Layard writes:—"The Curlew is not uncommon on our sea-board throughout its whole extent. I never heard of its breeding in the colony, though it is found here throughout the year. I met with it up the east coast as far as the Line." It was obtained at Mozambique by Peters; and the Curlew procured at the Seychelles and in Rodriguez by Mr. E. Newton must have been this species. The European form, which migrates down the west coast from Morocco, does not seem to extend further south than Ashantee.

Habits.—In Ceylon the Curlew frequents sand banks and sand flats left bare by the daily receding of the tide, marshy land near the estuaries of large rivers, the margins of salt lagoons, and may sometimes be seen assembled on grass-land near salt lakes and leways. It is, however, seen in far greater numbers on the tidal foreshores of the open coast and the islands on the north-west than it is about backwaters a little distance inland. No shore-bird can be more interesting to the lover of the wild haunts of sea-fowl than the Curlew. His fine note sounding clearly above the roar of the sea, or startling the ear of the voyager on a moonlight night as he is cruising in a Jaffna canoe on the smooth waters of the north-west coast, has something inexpressibly wild in it, and reminds him of days gone by when he stalked the same wary, cautious bird on the iron-bound coasts of Scotland, or on the grand hill-moors of Yorkshire and Westmoreland, and listened to the same free, far-reaching cry. The time to see them to perfection is when the tide is beginning to leave the waste flats off the north-west coast of Ceylon, and small parties of two, three, six, and more are wending their way towards some chosen feeding-ground, on which the water is just becoming shallow enough for them to wade in. From all directions up and down the coast they come, and shortly after the ground is bare a vast flock of several hundreds are stalking about, uttering their sociable note, quite different from

the wild flight-ery *koi-oirr*. When "beached" in my sailing-canoe some distance from land on a moonlight night I have listened to these assemblies and heard the noise of thousands of Sandpipers, Curlews, Crab-Plovers, &c., gradually increasing as the tide receded, and the ripple of the water against the bottom of my frail craft ceased by degrees, until I was "high and dry," and all was still save the mingled voices of the myriads of birds around me. The flight of the Curlew is powerful and performed with regular beatings of the wings; when alarmed it is capable of proceeding with great speed; and when a flock are together it is a fine sight to see them swerve about in their headlong course, turning first to one side and then the other. When alighting they descend sometimes with great rapidity towards the ground, with half-closed wings, which they spread out on nearing the earth, and so check their course. When walking, the Curlew has rather an awkward appearance; its body is nearly horizontal and its bill pointed downwards ready to snap up its food. It takes little runs of a few paces when catching the sand-flies, mollusks, sea-worms, &c. which it feeds upon, and at other times stalks leisurely about. When winged it runs with considerable speed while being pursued. It maintains its characteristic shyness everywhere, for Layard remarks of it in South Africa that it rarely falls to the gun of the sportsman. Its flesh is in general fishy in taste, and is always inferior to that of the Whimbrel.

I know nothing of the *nidification* of this species. Prjevalsky says that he found it breeding in the Hoang-ho valley in small numbers, and also at Lake Hanka; but no details of its nesting are given. The eggs are, in all probability, similar to those of the European form, which are dusky olive, blotched and spotted with brown, and measure about 2.6 inches by 1.8.

NUMENIUS PHÆOPUS.

(THE WHIMBREL.)

Scolopax phæopus, Linn. Syst. Nat. i. p. 243 (1766).

Numenius phæopus (Linn.), Lath. Ind. Orn. ii. p. 711 (1790); Horsf. Trans. Linn. Soc. xiii. p. 191 (1821); Gould, B. of Eur. iv. pl. 303 (1837); Blyth, Cat. B. Mus. A. S. B. p. 268 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schleg. Mus. P.-B. *Scolopaces*, p. 93 (1864); Jerdon, B. of Ind. iii. p. 684 (1864); Swinhoe, P. Z. S. 1871, p. 410; Holdsw. P. Z. S. 1872, p. 474; Dresser, B. of Eur. pt. 17 (1873); Gould, B. of Gt. Britain, iv. pl. 49 (1873); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1150 (1873); Salvadori, Ucc. di Borneo, p. 333 (1874); Hume, Str. Feath. 1874, p. 297; Legge, Ibis, 1875, p. 402; Irby, B. of Gibraltar, p. 178 (1875); Walden, Trans. Z. S. 1875, ix. p. 232; Hume, Str. Feath. 1875, p. 183; Butler & Hume, *ibid.* 1876, p. 16; Armstrong, *t. c.* p. 342; Hume, *t. c.* p. 464; *id.* *ibid.* 1878 (B. of Tenass.), p. 460; Butler, *ibid.* 1878, vii. p. 187; Hume, *ibid.* 1879, viii. (List B. of Ind.) p. 112; Meyer, Ibis, 1879, p. 142.

Numenius uropygialis, Gould, B. Austr. vi. pl. 43 (1848).

Courlis tacheté de l'isle de Luçon, Sonnerat.

Le petit Courlis, Buffon; *Regenbrachvogel*, German; *Zarapito*, Spanish (Saunders); *Maçarico*, Portuguese (Smith); *Ko-shaku-shigi*, Japanese; *Corbijeu*, Seychelles (Newton); *Little Curlew* of some; *Half-Curlew*, *Jack Curlew*, *Whimbrel-Curlew*, vulg. in England. *Chota gounge*, Hind. (Jerdon); *Malle kotan*, Tamils in north of Ceylon.

Adult male (Ceylon). Length 16.5 to 17.2 inches; wing 9.0 to 9.4; tail 3.9; tarsus 2.3; middle toe and claw 1.55 to 1.6; bill at point, along culmen, 3.1 to 3.5.

Female. Length 17.0 to 17.5 inches; wing 9.3 to 9.5, ext. 30.5; tarsus 2.8.

Iris dark brown; bill dark brown on the upper mandible, deepening at the tip; basal half of lower mandible fleshy, in some fleshy red, darkening to brown at the tip; legs and feet greyish blue or bluish leaden, the joints and toes dusky.

Head, interscapular region, tertials, and wing-coverts dark brown, paling slightly on the hind neck and its sides; the feathers of the neck and interscapular region pale-edged; the scapulars and tertials with marginal pale spots, the coverts with edges and broad marginal spots of white, and the head with a whitish mesial stripe and a smaller patch above the lores; greater secondary coverts barred with white, and the quills and winglet as in the last, the ground-colour of the primaries darker and with a strong greenish gloss; face more or less striped with brown; chin, gorge, breast, lower parts, axillary plume, under wing-coverts, lower back, and rump pure white; upper tail-coverts barred with pale brown; tail light smoky, barred with brown; fore neck and chest thickly lined with brown on a whitish ground, the markings being more open on the chest, and spreading down to the sides of the breast and flanks in angular bars and terminal shaft-lines; axillaries openly barred with brown; lateral under tail-covert feathers with dark mesial lines; secondary under wing-coverts white, primary series white, with dark shafts, the longer row brown, edged with white.

Birds of the year have the base of the under mandible fleshy, and the bill shorter than in the adult, measuring less than 3.0 inches from gape (straight).

The upper surface and head darker than in the adult, and the rump *barred*, but less so than the tail-coverts; markings of the fore neck darker than in the adult, the axillaries with broader bars, and the under tail-coverts generally centred and spotted with brown, sometimes only with mesial lines of this colour.

Obs. The bill varies in length in this species, but not so much so as the last. The measurements of a Burmese

example (♂) given by Dr. Armstrong are:—"Length 17.5 inches; expanse 28.0; tail from vent 3.8; wing 9.2; tarsus 2.4; bill from gape 3.8. Males from the Andamans are set down by Mr. Hume as measuring in the wing 9.0 to 9.5, and in bill from gape 3.05 to 3.12; weight 12 oz. The dimensions given of the females are exceedingly large:—Length 18.0 to 18.5 inches; wing 9.75 to 10.6; bill from gape 3.5 to 3.58; weight 1 lb. My own measurements are taken from a small series of only six Ceylon examples, and may not therefore correctly represent the maximum size of examples visiting the island. A Heligoland skin in the national collection measures:—wing 9.6 inches; tarsus 3.5; bill to gape (straight) 3.5.

Formosan examples of *N. luzonensis*, Gm.(= *N. uropygialis*, Gould), collected by Swinhoe, resemble entirely immature Ceylon birds, having the back marked precisely the same, as also the axillaries; and the rump, instead of being pure white, is white barred with brown. On this latter character Gould founded his species, but it is unquestionably an immature sign. Herr Meyer writes me that he shares Salvadori's opinion that this Malayo-Australian form is distinct, from which it may perhaps be inferred (he does not state the fact) that all the birds procured in this region have barred rumps; but unless this is the case the species cannot be considered a good one; for in the genus *Numenius*, of all others, it is unsafe to trust to a trifling character such as that in question. A pronounced difference in ground-colour, or a constant type of axillary-marking or coloration, is necessary before we can safely found a good species in this group of birds.

N. minor, Müller, from Australia, the representative of the small *N. borealis* of America, has the axillaries white, distantly barred with pale brown, and the rump and upper tail-coverts are brown spotted with white, while the underparts are buff. An example in Mr. Harting's collection measures 6.8 inches in the wing.

N. tenuirostris, Vicill., conspicuous for its slender bill, has the rump and upper tail-coverts striped with black, and the axillaries pure white. In an example before me, from Malta, the wing measures 9.0 inches.

Distribution.—The Whimbrel arrives early in Ceylon in September, and leaves again in April. It is not so abundant as the last species; and is, I think, found in greater numbers in the Jaffna peninsula than on the east coast. At Illipekadua, seven miles to the north of Manaar, as well as at this latter place, I have seen a good many in March. They are first seen in the Trincomalee district at the end of September and the beginning of October, and to the north of that port are tolerably common, as is also the case at Mullaitivu. Mr. Hayes, of the Ceylon Public-Works Department, has seen it between the latter place and Vavonia Velankulam; but how far inland I am unable to say; according to the experience of Layard and myself, it does not wander inland at all. It extends down the east coast to the Hambantota district, throughout which it is found, but more rarely than in the north. I have seen it at Chilaw and near Negombo, and also at the mouth of the Kelani ganga, near Colombo. It may be heard not unfrequently, during the north-east monsoon, flying over the Galle face at night; and is, I have no doubt, met with here and there, though rarely on the coast to the south of Colombo. I have not myself observed it in the Galle district. Among other places not far from the sea-coast where it is likely to occur is the large tank at Kanthelai.

Jerdon states that this species is found throughout India, and is more abundant than the Curlew. From recent testimony in 'Stray Feathers,' the reverse would appear to be the case. It is almost entirely confined to the sea-coast, and occurs probably all round the Indian sea-board. Dr. Armstrong procured it in Ramisserum Island; and in the Laccadives Mr. Hume found it more numerous than the Curlew, meeting with it on the islands of Kiltan, Amiri, and Betra Par. About Calcutta it is not so common as its larger relative, but few specimens being seen in the market during the season. Mr. Hume writes as follows on its distribution in the north-west:—"The Whimbrel is a good deal of a coast-bird, according to my experience, and is comparatively rare in India at any great distance from the sea. Mr. Adam never procured it at Sambhur, nor did I see it there nor anywhere in Jodhpoor, nor in the interior of Sindh, nor has any of my correspondents sent or recorded it from that entourage. Along the coasts of Sindh it occurs, is common on those of Cutch and Kattiawar, and thence round the entire coast-line to Mergui." In Guzerat Captain Butler says it is rare; but he designates it as very common in Kurrachee harbour, some remaining all the year, but not to breed. Major Le Messurier has noticed it in the delta of the Indus in August. Mr. Blanford met with a small Curlew, thought to be this species, in the Persian Gulf. Eastward it has been obtained at Thayetmyo in Burmah, and in the Irrawaddy delta Dr. Armstrong found it common. "It occurs," writes Mr. Hume, "in Tenasserim; but rather sparingly along and near the coast throughout the province." Mr. Davison has seen it about the Tavoy river in July; so that barren birds appear to remain in various places throughout the year. In the Andamans and Nicobars it is, says this gentleman, oftener met with than the Curlew. It was seen at

Port Blair in the second week of May, and it was also procured on the 16th of September ; it was usually seen in small flocks, which fed on the mud banks left exposed by the ebb of the tide.

If we unite the Australian and the Asiatic forms, we find this Whimbrel occurring in the Philippines and throughout the Malay Archipelago. Herr Meyer has been kind enough to inform me that it has been procured in the following months from the islands here named :—January : Amboina, Cebu, Malanipa (near Zamboanga). February : Amboina, Waigiou, Gebe, Timor. March : South Celebes, N. Celebes, Batchian, Waigiou, Admiralty Islands. April : N. Celebes, Halmahera, Ceram, Flores, Jobi. May : Ternate, Waigiou. June : New Guinea. July : New Guinea. August : Maetan (Philippine Isl.), Central Celebes (Gulf of Tomini). September : Morotai, Batchian, Kei, Aru. October : Ternate, Borneo. November : Halmahera, Ceram, Timor. December : Cujo (Philippine Isl.).

It has also been obtained in Sumatra and Banka. It is recorded by Mr. Gould as occurring in winter throughout the coasts of Australia, including Tasmania, as also by Mr. Ramsay in his recent "Distribution" list. Turning north again, we find Swinhoe recording it from Formosa and the southern coasts of China, as also from the maritime region between Peking and Shanghai. In Japan, according to Messrs. Blakiston and Pryer, it has been found in Yezo and Tokio, and at Yokohama and Hakodadi. Regarding its distribution in Asia, it does not seem to extend to the extensive northern parts of the continent ; for I do not find it recorded from N.E. Siberia, nor from the Yenesei and Ob rivers, although it follows the north-east coast to Kamtchatka, whence it has been recorded. Von Schrenck likewise did not notice it in Amoor Land. Radde, however, met with it in the western portion of East Siberia ; and M. Taczanowski obtained it in Dauria.

In Palestine Canon Tristram saw a small Curlew, which may have been this species, but did not procure a specimen. In Southern Europe it is common in winter ; but it is seen in greatest numbers in Italy, Transylvania, and Turkey on its spring migration to the north. In the latter country it does not appear to be common ; it occurs near Constantinople, and has been seen in Macedonia. In the summer it is found in Northern Europe to the shores of the Arctic Sea, and breeds in Finland, Northern Russia, Scandinavia, and Iceland, in which latter island it is common. It is also found in Greenland. It is abundant at this season in the Faroe Islands. It nidificates as far south as Schleswig Holstein and Great Britain ; in the latter of which regions its breeding-places are restricted to the Orkneys and Shetlands, the coasts of Sutherlandshire and Caithness, and it is asserted that it has bred in Yorkshire. It is found in autumn, winter, and spring on the coast of England and in France. In Portugal it is common in winter, and is likewise so in Spain, according to Mr. Saunders. In Andalucia Col. Irby says it is plentiful in autumn and spring, and a few are seen in winter. It inhabits the Azores and the Cape-Verd Islands, in the former of which Mr. DuCane Godman met with it. It has a wide distribution in Africa, extending eastwards to the Seychelles, and also to Madagascar, Mauritius, and Bourbon. In the island of Mahé, in the former group, Mr. E. Newton found it plentiful. It does not appear to be resident on all parts of the north coast in the winter ; for Favier says that it arrives early in the autumn in Morocco, and is for a time very common, passing south for the winter. It has been observed in Algeria and Tunis, and in Egypt it remains throughout the winter. Von Heuglin states that it is chiefly an autumn and winter species in North-east Africa, but that he has seen it in spring in Lower Egypt ; it has been procured on the Blue Nile and in Abyssinia ; Mr. Blanford obtained it at Massowa, and Von Hemprich procured it on the coast of Arabia. It has been observed at Zanzibar on its way south ; and in the Transvaal Mr. Ayres obtained it in November ; he also noticed it in Natal, where it is, however, not so plentiful as the Curlew. It is stated to be resident in Madagascar, probably owing to barren birds remaining there in the breeding-season. Layard remarks that it is rare in Cape colony, two specimens shot near Cape Town only coming under his notice.

Mr. Andersson obtained it in Walvisch Bay ; and north of Damara Land it has been observed at most places on the west coast, including the island of St. Thomas and Gaboon. Captain Shelley procured it on the Gold Coast, and Pel in Ashantee. Governor Ussher says that it is more frequent in Sierra Leone than on the Gold Coast. It is also recorded from Gambia.

Habits.—This widely-distributed species is not so shy as the Curlew, and does not associate in such large flocks. It is frequently noticed alone, or three or four scattered along an extent of half a mile of sea-beach,

each one appearing to be entirely independent of the other. On its first arriving I used to find it frequenting the rocks in the secluded bays in Trineomalie harbour, several being found in one little cove perhaps: at night they resorted from various points to an island to roost; and this habit has been noticed by others, although it must be understood that it is not stationary throughout the night, as it is to a great extent a nocturnal feeder. I have invariably found the stomachs of those shot in the early morning full of food, and sometimes the reverse has been the case when I procured them in the evening. They are fonder of rocks than the Curlew, as they find their favourite food (crabs) in such places; these they swallow whole after breaking off the legs and claws; even when I have shot them on the mud flats bordering large salt lagoons I have found their stomachs chiefly containing small crabs. In spite of its crustacean diet its flesh is better eating than that of the Curlew, which is in general, as I have stated, very fishy. The flight of the Whimbrel is strong and swift, and in style resembles that of the Curlew. When it is proceeding to some distant point, it mounts high in the air, and during its course gives out, now and then, its loud and well-known call, which may always be known from the dissyllabic call of its larger congener by its hoarseness and longer duration. A writer, in speaking of its habits in Iona says, "the unusual and peculiar cry of the Whimbrel announces the fact that summer is nigh. Its call consists of several rapidly-repeated, short and clear whistles, uttered about seven times in rapid succession; whence its name of *Seven Whistler* has been derived. This cry is heard as the flocks are flying to and fro high in the air." Towards evening I have found it shier than in the morning, and it is sometimes so wary that much stalking is required to get within shot of it. Some writers affirm that the Whimbrel is very fond of bilberries and whortleberries; but I am unable to testify to the truth of this statement.

Nidification.—The breeding-season of this species is in June and July. In the hills in Scotland and in the Orkneys it nests on the ground in heathy situations, and uses pieces of heather, dry grass, bents, &c. for the material. Mr. Collett describes the nest as "simply a depression in the soil on the top of some slight elevation in any comparatively dry spot in the marshes, and is usually lined with a few grass-bents or leaves." Captain Feilden, who found it breeding in great numbers in the Faroes, discovered one nest between two blocks of stone, which just gave room enough for the bird to squeeze between. He remarks, "it is of a pugnacious disposition whilst breeding, and is constantly on the alert to drive off intruders from the vicinity of the nest; I have watched them by the hour chasing the Lesser Black-backed Gull (*L. fuscus*). When engaged in these combats their flight is rapid and arrow-like, whilst they constantly repeat their trilling cry, which has not inaptly been described as resembling the words *tetty, tetty, tetty, tet.*" The nesting-time there is in May and June. The eggs are three or four in number; they are dusky olive in colour, blotched and spotted with dark brown, and eluded with the same often at the large end; sometimes eggs are found quite unspotted. They measure 2·3 inches by 1·4.

With regard to Herr Meyer's remarks in the Ibis (1879, p. 142) that this bird breeds in "small trees" in Celebes, he writes me that small bushes were intended to be implied, and that he considers the information he received to be trustworthy.

I take the opportunity of remarking here, at the termination of my articles on the Scolopacidae, that I have just heard of the occurrence of the Sanderling (*Calidris arenaria*) in Ceylon. An article, therefore, on this species will be given in the Appendix.

GRALLÆ.

Fam. PARRIDÆ*.

Bill moderate, straight, compressed; nostrils pervious. Wings moderately long. Tail in some lengthened, in others short. Legs of medium length; feet enormous; claws very long.

Wing with a sharp spur at the flexure. Sternum not compressed laterally as in Rallidæ, but Charadrine in structure, with a large notch in the posterior margin.

Genus HYDROPHASIANUS.

Bill slender, straight, moderately compressed, the apical portion enlarged and curved; the gonyes pronounced; nostrils linear, pervious, placed in a long depression. Wings lengthened, with a stout, sharp spur at the flexure; quills pointed, the 1st with the terminal portion of the shaft produced and slightly webbed, the 2nd and the 3rd with the shaft produced beyond the web, and the 4th with the web attenuated. Tail long, with the central feathers much lengthened during the breeding-season. Tibia bare to a considerable height. Tarsus shorter than the middle toe, and shielded before and behind with rectangular scales. Toes and claws very long, the latter straight; the hind claw much longer than the toe and *curved upwards*.

HYDROPHASIANUS CHIRURGUS.

(THE WATER-PHEASANT.)

Tringa chirurgus, Scopoli, Del. Fl. et Faun. Insubr. ii. p. 92 (1786), *ex* Sonn.

Parra luzonensis, Gm. Syst. Nat. i. p. 709 (1788).

Parra sinensis (Gm.), Schlegel, Mus. P.-B. *Ralli*, p. 71 (1865).

Hydrophasianus sinensis (Gm.), Wagler, Isis, 1832, p. 279; Kelaart, Prodrömus, Cat. p. 135 (1852); Gould, B. of Asia, pt. vii. pl. 3 (1855).

Hydrophasianus chirurgus (Scop.), Blyth, Cat. B. Mus. A. S. B. p. 273 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 709 (1864); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 475; Hume, Str. Feath. 1873, p. 249; id. Lahore to Yarkand, p. 290 (1873); Salvadori, Uccelli di Born. p. 343 (1874); Legge, Ibis, 1874, p. 30; id. J. A. S. (Ceylon Branch), 1874, p. 54; Hume, Nests and Eggs, iii. p. 592 (1875); Walden, Trans. Zool. Soc. 1875, ix. p. 232; Hume & Oates, Str. Feath. 1875, p. 185; Le Messurier, *t. c.* p. 381; Butler & Hume, *ibid.* 1876, p. 20; Hume, *ibid.* (B. of Tenass.), 1878, p. 464; Davidson & Wender, *ibid.* 1878, vii. p. 89; Ball, *t. c.* p. 229; Cripps, *t. c.* p. 304; Hume, *ibid.* 1879, p. 113 (List B. of Ind.).

Le Chirurgien de l'isle de Luçon, Sonnerat, Voy. Nouv. Guin. p. 81, pl. 45 (1770); *Chinese*

* The Scolopacine egg, Plover-like bill, spurred wing, strong, straight flight, and general deportment of the Jacanas indicate their position as being between the last family and the Plovers.

Jacana (Lath.); *The Pheasant-tailed Jacana* (Jerdon); *Yellow-backed Jacana* (Sykes).
Piho, *Pihuya*, Hind.; *Dal-kukra*, *Dal-pipi*, *Jab-manjor Chittra billai*, Bengal.; *Sardal*,
Sukdal, also *Miwa* in some parts (Jerdon).

Balal Saaru, lit. "Cat Teal," from its cry; also *Newya*, Sinhalese.

Adult male, in breeding-plumage. Length 16.2 to 18.0 inches; wing 7.8 to 8.1; tail 8.0 to 10.0; tarsus 2.0 to 2.3; middle toe 2.3 to 2.4, claw 0.75; hind toe 0.8, claw 1.2; bill to gape 1.1.

Adult female, in breeding-plumage. Length 18.0 to 21.5 inches; wing 8.5 to 9.25; tail 11.0 to 12.75; middle toe and claw 3.1 to 3.3; hind claw 1.5 to 1.7; bill to gape 1.25; alar spur 0.3 to 0.35.

Iris deep brown; bill light blue at the base, the tip paler or greenish in some; legs and feet plumbeous blue, claws black.

Head, face, throat, fore neck, wing-coverts, secondaries, under wing-coverts, the most part of all but the two outer primaries and the base of the 2nd white; hind neck pale glistening yellow, surmounted by a black nuchal patch, and with a blackish edge at the sides; back and tail blackish brown, with green and bronze reflections on the upper parts; scapulars and tertials dark olive-brown, with greenish reflections, the tertials pale towards the extremities; entire under surface up to the chest, passing up to the interscapular region, purplish black, darkest on the chest and palest on the thigh-coverts; 1st and 2nd primaries black, terminal portions of the remainder and margins of the outer secondaries towards the tip brownish black; 1st primary bare for about an inch from the tip, with a narrow web at the extremity, the next two with the points of the shafts exceeding the web, the 4th and 5th attenuated and rounded at the tip.

Winter plumage. Tail very short, 3.5 to 4.0 inches; primaries apparently not so long; alar spur undeveloped.

The question of the short primaries requires investigation; I have found them shorter in one or two specimens.

Iris yellowish, often with a brown inner circle. Top of head, centre of hind neck, upper back, scapulars, tertials, and central tail-feathers hair-brown, darkening to blackish brown on the rump, and with green and bronze reflections on the back and scapulars; lesser and median wing-coverts pale brown, the terminal portions of the feathers barred with blackish brown and whitish; rest of the wing as in summer, but in some the 2nd and 3rd primaries are similarly pointed to the 1st; supercilium, lower part of eye-fringe, fore neck, under surface, under wing-coverts, and tail white; a black stripe from the gape beneath and down the side of the neck, passing in a band across the chest; above this, continuous with the supercilium, a broad shining yellow stripe; feathers beneath the pectoral band and at the side of the chest mottled with blackish.

In some examples some of the white flank-feathers remain in summer.

The breeding-plumage in Ceylon is donned at the beginning of the year. I have found most birds in the north-west and south-east of the island attired in it in February; and in the south of Ceylon I observed that in October all birds were in winter dress.

The nuptial plumage appears to be put on by a change of colour in the feather. An example in my collection, shot at Kurunegala in February, has the breast-feathers turning black, and those of the hind neck brown and glistening golden, the latter colour appearing at the base; the winter tail-feathers are moulted, and the larger breeding ones acquired simultaneously with the change in the clothing-feathers.

In the north of Ceylon the season of change is perhaps somewhat later; I have obtained birds in *old* feather and still in breeding-plumage in July.

The nestling is figured by Gray and Hardwicke as covered with buff down, tinged with grey on the sides of the neck and with reddish on the wings; a dull stripe through the eye, another down the hind neck and back, and a triple stripe starting from a band behind the wing, the outermost of which descends the thighs.

Young. Immature birds somewhat resemble winter examples; the supercilary line is ferruginous, the fore neck washed with fulvous, and the yellow neck-stripe much paler or less golden than in the adult; the pectoral band is not so strongly developed.

Obs. I find but little variation in this species from other parts of its habitat; but some Chinese specimens I have examined have the hind-neck golden patch very large and the black border very broad. These are probably individual peculiarities. A fine example in the Swinhoe collection measures:—wing 8.0 inches to end of web, 9.0 to end of appendage; tail 12.0. An Indian example in the British Museum measures 7.7 inches in the wing; tail 8.6; tarsus 2.0; middle toe 2.0, its claw (straight) 0.7.

Distribution.—The Water-Pheasant is pretty generally diffused throughout all the low country where there are waters suited to its habits, the tank-districts containing it in large numbers, owing to the abundance of its favourite haunts—lonely, Lotus-covered, jungle-surrounded sheets of water. There is perhaps scarcely a single tank, large or small, from the north down to Kurunegala on the west and to Hambantota on the south-east, which is not inhabited by it in greater or less numbers. It is not so numerous in the larger recently-restored tanks, which are now, as a rule, full of deep water, as in the larger class of village tanks, or those which are still at the mercy of the monsoon rains, which pour through the ruined embankments in great floods, and speedily leave the swampy areas as they were before. In the latter it confines itself to shallow nooks overgrown with weeds and Lotus-plants, while some of the former literally teem with it. On such sheets of water as the Peria kulam, Pan kulam, Kalpé tank, Wenriyan kulam, Topare, and Haboreenna tanks, and many such throughout the North-western Province and the Anaradhapura district, it is very abundant. I have met with it at all the tanks of the Eastern Province that I have visited; and Mr. Forbes Laurie tells me that it is very plentiful at Bintenne Lake. In the south-east it is very abundant in some localities, one of which, the tank at Sittrawella, near Tissa Maha Rama, I may cite in particular. It is not so plentiful in the South-west and the Western Province as in the tank-districts; but there are nevertheless localities in the neighbourhood of Matara and between that part and Amblangoda where numbers are to be found. I have met with it near Galle on isolated pieces of water or ponds in paddy-fields. On Bolgodde Lake it affects the shallow and weedy inlets on the shores of this large sheet of water. Near Colombo it is found at Kotte Lake and at Kæsbawa; and in the interior there are other localities frequented by it, it being abundant at the tank close to the town of Kurunegala.

Jerdon states that it is spread throughout India where there are jheels and weedy tanks. We have little data as yet afforded us in 'Stray Feathers' as to the particular localities in South India where it is abundant; and I notice that Mr. Bourdillon does not include it among the species which he saw at the Vellarney Lake, Southern Travancore. Messrs. Davidson and Wender observe that it occurs sparingly in the Deccan; and Dr. Fairbank likewise remarks that it is rare in that district. Mr. Ball says that it is occasionally seen in jheels in Chota Nagpur, and instances the Rajmehar hills, Manbhum, and Lohardugga as the localities in which he noticed it. In Furreedpore Mr. Cripps remarks that it is very common during the rains, and then found in every swamp. From October until March it disappears from that portion of the country. Elsewhere in Bengal we have Capt. Beavan's testimony for its occurrence at Rungpore and Berhampore.

It extends into the north-west of the empire, ascending the hills, according to Mr. Hume, and breeding freely even in Cashmere, in which region Dr. Henderson found it abundant near Banihál. The former gentleman observed it in Sindh at the inland tanks; and Capt. Butler records it as common in Northern Guzerat and the neighbourhood of Mount Aboo, but only during the cold weather. He, however, instances the case of a single example found near Deesa in the hot weather. Mr. Hume remarks that it is not uncommon in Kattiawar, Kutch, and Jodhpoor, as well as in Guzerat, and records it as abundant in the cool season at the Kunkrowlee Lake in Oodeypore. Turning eastward, we find Mr. Inglis stating that it is very rare in North-east Cachar; and in Upper Pegu Mr. Oates only met with one specimen, which he killed in February in winter plumage. In the Irrawaddy delta Dr. Armstrong did not procure it; but Captain Wardlaw Ramsay obtained it at Tonghoo. Three specimens only are recorded by Mr. Hume as having been shot during the rains at Thatone, and he states that its occurrence in Tenasserim must be looked upon as accidental. In the Indo-Chinese and Malayan region it appears to be sparingly distributed, for though we have ample record of its occurrence here and there, we do not find it stated that it is common anywhere, except perhaps in Java, from which island there is a fair series of specimens in the Leyden Museum; it was procured there by Diard. Salvadori records it doubtfully from Borneo; but from what part it is supposed to have come is not stated; it does not appear to have been met with in Sarawak. It was first made known to science from the Philippines, where it was procured in the island of Luzon by Sonnerat, who gave it the singular title of "Chirurgien" (surgeon) of that isle! Von Martens likewise procured it in that island. In Formosa Swinhoe met with it, and he likewise records it from the Amoy coast and from Hankow in the interior.

Habits.—This most singular and interesting bird, which appears to have no slight affinities with the Plovers, affects only such waters as are overgrown with floating vegetation, more particularly the Lotus-plant,

on the broad "bejewelled"* leaves of which it delights to walk, for facile progression on which its remarkable feet eminently adapt it. It may be said to form one of the principal ornithological features of the forest-begirt tanks of Ceylon; for though it is less conspicuous than the larger denizens of these beautiful but lonely spots, yet its graceful form, its walking, as it were, almost on the water, and its singular mewing call, commend themselves more than the attractions of other birds to the notice of the naturalist.

After a long march through the shady forests of the Northern Province, and (if we have chanced to arrive at the upper side of the tank) after threading our way through the low thorny jungle which invariably grows on the seasonally-submerged part of the "Kulam," we emerge from beneath the foliage, and find ourselves suddenly face to face with a scene such as none but those who have penetrated into these wild haunts of tropical bird-life can form any idea of. The weedy waste of water and the dark border of the primæval forest literally teem with birds, while ugly crocodiles are sleeping on the muddy slopes of the "bund," and myriads of frogs basking in the glaring sun send forth their contented croakings. If we have cautiously stepped into the open, and are standing partially screened by a spreading thorn tree, we have an opportunity of seeing the various species either reposing or busily engaged in sustaining life. Close at hand stalk about a dozen or more sombre-clad "Paddy-birds;" further out, standing knee-deep in the more open water, are an equal number of tall and snowy-white Egrets, with perhaps a grey Heron or two, quietly eyeing, with gracefully curved necks, the surrounding water; and on the topmost branches of the lofty trees growing on the opposite bund repose many more of the same birds, with probably two or three handsomely plumaged but ungainly-looking Pelican Ibises, who, having made their morning meal, are complacently viewing the labours of their less fortunate companions. Beneath this company of sentinels, on the lower outspreading branches, sit one or two sturdy Buff-headed Kingfishers, their huge bills pointed downwards, waiting for a plunge into the dark water beneath; and on the largest and most out-reaching limb of a Koombook tree lurks the watchful tank-Eagle (*Spilornis spilogaster*), who, though we cannot see him, has quickly espied us from afar, and is waiting, with crest erect and with his glaring yellow eyes fixed on us, to glide off on the least sign of our moving. On the branch of yonder fallen tree which stands out of the water sit half a dozen Lesser Cormorants with one or two long-necked Darters, drying their expanded wings in the sun; and hard by, careless of the position of their sable companions, are perched a pair of lovely little Kingfishers, who, with jerking tails and bobbing heads, send forth their shrill little whistlings, and now and then dart down on the tiny fish. A flock of Teal are slowly paddling along the edge of the open water, and others sitting on the rock which often rises from the deepest part; while last, but not least, numbers of elegant Water-Pheasants trip lightly over the glistening Lotus-leaves which are crowded into one corner of the tank, some flying across little open reaches of water, and others floating lightly on secluded parts, but all combining to give the finishing touch to the romantic scene.

But what a change in the picture! Some coveted and hapless specimen is sure to be within shot among this long list, and ere long a loud report echoes through the forest. Up start the white-winged Paddy-birds, and with a tremendous splash the frightened crocodiles rush beneath the water, the noisy Kingfishers dart from out the trees with discordant cries, the barred wings of the Eagle carry him quickly upwards, while the Cormorants and Teal career round and round the tank, and the Egrets disappear with loud croaks over the tops of the distant trees, and the affrighted Water-Pheasants, displaying their white wings, fly off to a place of safety and give vent to their fears in loud mewing calls.

But, to return from this long digression (which the memory of many such scenes forces upon the author) to the consideration of the habits of the Water-Pheasant, it may be remarked that it is an extremely noisy bird, particularly in the breeding-season, when the numbers which frequent such localities as I have just described call to each other all night long, their plaintive and not unmelodious notes keeping up an incessant nocturnal concert so loud that I have more than once, when sleeping on the borders of a tank, been kept

* On nearly every Lotus-leaf is a sparkling drop of water, glistening like a crystal on its green surface. The Thibetan Buddhists worship this. Dr. Henderson ('Lahore to Yarkand,' p. 47) found the words "Hail to the jewel in the Lotus, hail!" inscribed on stones which surmounted the piles called Mānēs in Thibet.

awake by it. It flies very well, and, when occasion calls for it, takes long flights. I have seen little flocks crossing the wide Bolgodde Lake at sundown, bent for some distant roosting-place: they flew just above the water, in close company, going along with considerable speed. The Water-Pheasant likewise swims well, and when on the water sits very buoyantly. If wounded it is almost impossible to procure, as it immediately dives, and, as Jerdon truly says, remains immersed with its bill only out of the water, and defies pursuit. Though socially inclined, these handsome birds do not keep very close company, but move about, each intent on its own business, at some little distance from one another. They feed on the seeds of water-plants and on grain when frequenting paddy-fields: in addition to such diet I have found small shrimps in the stomachs of some specimens; and Blyth states that some he kept in confinement thrive well on them, and were rather quarrelsome among themselves. Swinhoe justly remarks that when sitting they look dark and unnoticeable; but the wings once expanded they become conspicuous white objects. Their flight is somewhat peculiar, for though there is more time than is usually the case between each stroke of the wing, the beat is in itself very quickly performed. Their gait and deportment are quite different from those of the Rails.

Jerdon has the following note with regard to some of the natives of India and this bird:—"In Purneah the natives say that before the inundation, *i. e.* during the breeding-season, it calls *dub, dub, i. e.* 'go under water,' and afterwards, in the cold weather, *powar, powar*, which, in Purneah dialect, means 'next year.'"

Although the Singhalese idea of its note being like the mewing of a cat is not inapt, yet it must be said that there is but a slight resemblance in the tone of its cry to the voice of this quadruped; it is a much louder and rounder sound, and has a certain amount of intonation in it which would seem very strange issuing from a *feline* throat.

Nidification.—In the north-west of Ceylon this bird breeds in March and April: my friend Mr. Jeffreys, of Hindugalla Estate, informs me that he once found an egg deposited on a floating Lotus-leaf, the incubation of which was being performed by the sun; for at a little distance off the bird was watching it, and sallied out at a Brahminy Kite which flew over the spot. Two eggs taken by Mr. E. Creasey in the Jaffna district, and examined by me in the collection of Mr. MacVicar, were excessively pyriform in shape, showing the bird's affinity to the *Scolopacidae*, very smooth in texture, and of a uniform deep olive colour. They measured 1.46 by 1.02 inch and 1.36 by 1.03 respectively.

Mr. Hume writes thus of the nest of this Jacana:—"They lay from the middle of June till August; the nest (placed in any pond, jheel, or swamp, just as often on the outskirts of some village or small town as in amongst fields and jungle) is often a mass of weeds and rushes heaped together in the water, in the midst of the thickest grass and rice, and so low that the eggs are half-immersed in water. Occasionally the nests are amongst the grass of some little island, and then they are much slighter. At times, even when constructed in the water, they are so small as hardly to be able to contain the egg—little, shallow, circular cups of rush and water-weed on floating Lotus-leaves or tufts of water-grass." The eggs are laid point to point like the Snipe's and Plover's, and four is the usual number. The same writer says the eggs may be best described as pegtops without the pegs—cones slightly obtuse at the point, based upon somewhat flattened hemispheres; and he remarks likewise that the colour varies a good deal. They are rich deep bronze, sometimes a greenish and sometimes a more rufous-bronze colour; they become bleached by the sun occasionally to a stone-colour. They vary much in size, but average "1.46 by 1.12 inch."

GRALLÆ.

Fam. CHARADRIIDÆ.

Bill hard and not flexible, extremely variable in shape ; short in some, long and stout in others, and very slender in one group. Wings pointed ; tertials moderately long. Tail short. Legs lengthened and proportionately slender ; toes short ; *hind toe wanting in most genera* ; outer and middle toe joined at the base by a web, as also the inner toe in some.

Sternum generally with wide exterior fissure and a small interior one. Eye large in nearly all. Mostly of gregarious and littoral habit. Plumage in some genera the same throughout the year, in the majority changed at the breeding-time. Nesting on the ground.

Subfam. HIMANTIPODINÆ.

Bill slender and attenuated. Wings pointed ; tertials not elongated. Tail short, of 12 feathers. Legs very long and slender ; toes united in front by a web, in one genus much developed ; hind toe wanting or very minute.

Of moderate size.

Genus HIMANTOPUS.

Bill long, straight, very slender and attenuated at the tip, near which it is rounded ; culmen flattened at the base. Nostrils linear, in a groove running half the length of the bill. Wings very long and pointed ; 1st primary the longest and much exceeding the 2nd. Tail of 12 feathers, short and rounded. Legs very long and slender, the bare portion of tibia $\frac{3}{4}$ the length of tarsus ; hind toe wanting ; anterior toes short and connected at the base by a web, that between the outer and middle being considerably developed.

HIMANTOPUS CANDIDUS.

(THE COMMON STILT.)

Himantopus candidus, Bonnat. Tabl. Encycl. et Méthod. Orn. i. p. 24 (1791) ; Gould, B. of Eur. iv. pl. 280 (1837) ; Blyth, Cat. B. Mus. A. S. B. p. 264 (1849) ; Kelaart, Prodromus, Cat. p. 134 (1852) ; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265 ; Schlegel, Mus. P.-B. *Scolopaces*, p. 105 (1864) ; Jerdon, B. of Ind. iii. p. 705 (1864) ; Layard, B. of South Afr. no. 618 (1867) ; Swinhoe, P. Z. S. 1871, p. 405 ; Shelley, B. of Egypt, p. 260 (1872) ; Legge, P. Z. S. 1875, p. 376 ; Irby, B. of Gibraltar, p. 164 (1875) ; Dresser, B. of Eur. pt. 63, 64 (1877) ; David & Oust. Ois. de la Chine, p. 462

(1877); Hume, Str. Feath. (B. of Tenass.), 1878, p. 464; Ball, *ibid.* 1878, vii. p. 229; Cripps, *t.c.* p. 304; Hume, *ibid.* 1879, viii. (List Ind. B.) p. 113.

Himantopus intermedius, Blyth, Cat. B. Mus. A. S. B. p. 265 (1849, old bird); Hume, Str. Feath. 1873, p. 248; Adam, *ibid.* 1874, p. 339; Hume, *ibid.* 1875, p. 183; Legge, *t.c.* p. 363; Butler & Hume, *ibid.* 1876, p. 18; Scully, *t.c.* p. 190; Hume, Nests and Eggs, iii. p. 589 (1875).

Himantopus autumnalis (Hasselq.), Holdsw. P. Z. S. 1872, p. 475; Legge, Ibis, 1875, p. 403; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1177 (1874); Walden, Trans. Zool. Soc. 1875, ix. p. 228.

Échasse, Buffon, Pl. Enl. 873; *Long-legged Plover*, Lath.; *Black-winged Stilt*; *schwarz-flügelicher Stelzenläufer*, German; *Ziguiñuela*, Spanish (Saunders); *The long-legged Avocet*, Kelaart; "*Long legs*," "*Water-Pigeon*," *Stit-Plover*, Europeans in north of Ceylon. *Kakhshal pachak*, Turki (Scully); *Pavile-kali*, Ceylonese Tamils.

Adult male and female (Ceylon). Length 13.3 to 15.1 inches; wing 9.0 to 9.3; tail 3.0 to 3.25; tarsus 4.7 to 5.3; tibia (bare) 2.9 to 3.8; middle toe and claw 1.7 to 1.8; bill at front 2.6 to 2.7, to gape 2.7 to 3.0.

Iris scarlet or lake-red; bill black, sometimes with the extreme tip white; legs and feet (variable) lake-red or pink-red; claws black.

Head, hind neck down to the shoulders, back, rump, upper tail-coverts, entire under surface, axillary plume, and beneath the humerus white, the occiput and nape more or less mingled with iron-grey, caused by the dark bases of the feathers in these parts showing on the surface; anterior margin of the eye dark; interscapular region, scapulars, and wings glossy green-black; tail usually pale greyish white, in some quite white; under surface of wing coal-black.

Young. The chick, when leaving the nest, has the bill blackish; legs and feet greenish olive. Head and nape black, mottled with ochraceous; upper part of hind neck, forehead, and all beneath white; lower hind neck, interscapular region, and wings dark olivaceous green, tipped fulvous; back buff, with velvety-black bars; tail barred black and buff.

In the first stage of plumage, during the months of August and September in Ceylon, the iris is salmon-red with dark mottlings; bill blackish olive, paler at the base of upper mandible, and reddish at the base beneath; tibia and front of tarsi brownish yellow; the joints bluish grey; feet and sides of tarsi brownish.

Forehead, face, throat, sides of neck and all beneath, back, rump, and upper tail-coverts white, the latter grey near the tip, with fulvous tips; crown and nape, interscapular region, scapulars, and tertials blackish brown, paling on the hind neck into greyish brown, each feather with a buff-yellow margin; wing-coverts and quills black, with a green gloss, the coverts edged as the back, the secondaries and inner primaries paling to brownish at the extremities, with white tips; tail French grey, darkening towards the tip, which is fulvous.

In the cool season birds of the year have the interscapular region, scapulars, and terminal portion of tertials brown, often margined with greyish; the nape and hind neck sullied with iron-grey, and the tail and tips of the upper tail-coverts French grey; the ear-coverts in some greyish and in others white.

Iris (variable) in some red, in others orange, mottled with deep red; bill dusky reddish at the base beneath.

Obs. Many individuals, after assuming the adult plumage on the back and wings, are found with the crown, nape, and cheeks rather dark brown; the hind neck, at the same time, is uniform mouse-grey. I have seen birds in the autumn with this plumage, which I conceive to be that of the second year; and it is probable that they do not assume the white heads until the third or fourth year. I have found birds breeding with iron-grey heads; and these were evidently not fully aged individuals. There is in most specimens which I have examined a grey appearance about the head and hind neck caused by the dark bases of the feathers; and I have observed the same thing in European examples. The example figured in Dresser's 'Birds of Europe,' and which I have before me, appears to be abnormally dark on the head and hind neck. I have never seen such another; for the parts in question are almost as black as the back. It is a male; wing 9.5 inches. Some valuable measurements of Yarkand specimens are given by Dr. Scully, which I append here for comparison:—"Males. Length 14.8 to 15.2 inches; wing 9.6 to 10.2, expanse 28.5 to 31.6; tail 2.9 to 3.3; bare portion of tibia 3.3 to 3.5; tarsus 4.8 to 5.0;

bill to gape 2·7 to 3·0; weight 4·5 oz. to 6·5 oz. *Females.* Length 14·0 to 14·9; wing 9·0 to 9·5, expanse 28·0 to 29·0; tail 3·0 to 3·3; bare portion of tibia 2·5 to 2·8; bill from gape 2·6 to 2·8; weight 5·0 oz. to 5·5 oz."

Other species of Stilt are :—

Himantopus leucocephalus, Gould, which inhabits the Philippines and the Austro-Malayan region, differs in having the whole head, nape, and throat *pure* white, with the hind neck black, taking the form of a longitudinal black band with a sharply-defined transverse edge below the nape, and the same at the lower part of the neck, below which it is white as far as the interscapulars, which, together with the wings, are green-black; the lower parts, back, and tail are white, the centre tail-feathers sullied with greyish. A male (Celebes) measures—wing 9·3 inches, tarsus 4·6, bare tibia 3·0, bill to gape 2·4. At one stage, probably the second year, this species appears to resemble some examples of the Common Stilt in having a greyish hind neck, for Blyth states that he has seen Australian birds which corresponded with Indian specimens of the latter.

Himantopus novæ-zealandiæ, Gould, is entirely sooty black, glossed on the upper surface with green.

H. nigricollis, Vieill., and *H. brasiliensis*, Brehm., are American species, the former inhabiting North, and straying to South, America, and having the hind neck glossy black, as also the head to in front of the eye. The latter, inhabiting South America, has the hind neck black as far as the nape, from which two "horns" of the same colour advance to the eyes. A Valparaiso example in the British Museum measures—wing 9·7 inches, tarsus 4·8, bill to gape 3·7.

Distribution.—The Stilt is found in tolerable abundance in the northern and eastern parts of Ceylon, extending on the latter side to the Hambantota district. It affects the backwaters, tidal lagoons, marshes, and flooded fields in the wet season in the maritime districts, and is also partial to tanks, both large and small, not very far inland, which are surrounded by marshes of moderate extent. In the wet season they move about a good deal, and are found in flooded lands in places where they are never seen in dry weather. They are abundant in the breeding-season at Kanthelai, Minery, and other large marsh-begirt tanks in the northern half of Ceylon; and in the south-east of the island I have met with them in the Wellaway Korale, as well as at their breeding-grounds in the coast-districts. In the Jaffna peninsula they frequent the large lagoon between Ethelmaduvel and Potoor. In the north-east, between Trincomalee and Mullaitivu, they are not common on the salt lagoons, except in the wet season, when they resort to the marshes surrounding these localities. I have not seen any Stilts south of Chilaw on the west coast. At Aripu Mr. Holdsworth says they are common during the rains.

The present species is very abundant in many parts of India, particularly in the north-west; but it appears to be chiefly a cold-weather visitant, the only districts in which it is resident and breeds being the North-west Provinces near Delhi, and the western portion of Jodhpur near the Sambhur Lake. It is decidedly a resident bird in Ceylon; and I do not think that its numbers are much increased in the cool weather, though there may be an influx at that time from the coast of India, and it is therefore all the more strange that it should not be stationary in India. In the Deccan it is a cold-weather visitant, and common in those districts which Messrs. Davidson and Wender collected in. The Rev. Dr. Fairbank records it from Ahmednagar. On the eastern side of the peninsula, further north, it is apparently not so common, for I only find it noted from the Rajmehar hills and Lohardugga, near Calcutta. Mr. Hume remarks that it is noticed in the market about once a week in the cold season. In Furrcehpore, Eastern Bengal, it is, says Mr. Cripps, "common in the larger swamps in small batches of eight or ten. By the end of March they commence leaving the district." On the eastern side of the Bay of Bengal its numbers diminish materially. In Pegu a few appear at times, but it is not a common bird (*Oates*); and in Tenasserim it is perhaps rarer still, for, besides being recorded by Captain W. Ramsay from the Karen hills, it has only been rarely observed about the creeks in the tract between the Salween and Sittang (*Hume*). Turning westward again, we find it stated to be common in the Goorgaon district, near Delhi, in Upper India, where there is a "central breeding-haunt." In Jodhpoor it is abundant in the cold season; immense flocks frequent the Sambhur Lake from the commencement of the rains until the beginning of the hot weather; and in September Mr. Adam obtained nestlings there. In February Mr. Hume met with it during the drought in small tanks and pools in other parts of Jodhpoor, and also in the month of February in Oodeypore. In Guzerat it is common in the cold weather, arriving about July; and it occurs, says Capt. Butler, round the edges of the lake at Mt. Aboo. It is likewise common in Cutch and Kattiarwar, but less so in Sindh than in Upper India. In Kashgar it is a seasonal visitant, writes Dr. Scully, and breeds there. It arrives in May, and probably

leaves about the end of September, never being seen in winter. "Near Yarkand in summer the birds are found in enormous numbers, frequenting small pools, little lakes, and marshy ground." It breeds throughout Turkestan up to an elevation of 4000 feet (*Severtzoff*). Pallas met with it, according to Jerdon, at "salt lakes in Central Asia." Prjevalsky writes that it "breeds on the Hoang-ho only about small lakes and in marshes. Some birds were observed on the 23rd of April." He considers that the bend of the Hoang-ho forms the northern limit of its distribution, it not having been recorded from Lake Baikal or the Amoor. Eastwards it is found in China, but not so far north as Japan. In the former country it was met with in the Pekin district by Père David. It probably occurs further south, as it has been known to wander to the Philippines, where it was procured in Luzon by Von Marteus. Turning westward again, we find it in Palestine and Asia Minor; and in the former country (if not in the latter) it is resident and breeds, according to Canon Tristram. In Europe it is common in the southern portion, frequenting the shores of the Black Sea and the Lower Danube, breeding at Kustendji. It passes through Greece, and arrives in the Epirus in March, April, and May, breeding, according to Lord Lilford, in great numbers further north in Dalmatia. It occurs on passage in the islands of the Mediterranean, but appears to be a winter visitor to Sardinia. It passes through Transylvania in small numbers in the spring, and is occasionally met with at that season in Southern Germany. It has bred in Saxony; but further north it is a straggler, having occurred as high up as Denmark on three occasions only. It has been killed a good many times in England, and has been observed in Scotland near Dumfries, and on the Clyde, as also in Forfarshire and Perthshire. It has strayed as far north as the Orkneys and Shetlands, and has also occurred in Ireland. In Belgium, as also in France, it is a straggler. It breeds in Spain in the marshes of the Coto del Rey, where it was found by Mr. Howard Saunders; and in Portugal it is said to be not uncommon. It is abundant near Gibraltar, and in "the marismas of the Guadalquivir their numbers are," says Col. Irby, "perfectly marvellous." It is migratory to this district, passing north towards the end of March and beginning of April; and though a few remain in the winter, they disappear for the most part in October. Eggs are laid, according to this writer, as early as the 28th of April. In Morocco it is very abundant, particularly at Masharalhaddar. Favier states that it frequents the freshwater lakes south of Tangier, breeding there. A few were met with in this region by Mr. T. Drake. In Algeria it is not uncommon; and it was found nesting at Laghouat by Canon Tristram. In Egypt and Nubia it is very abundant, especially in the Delta. Von Heuglin found it breeding in the latter district, and believes that it nests in Central Egypt, Fayoom, Nubia, and also in the marshes of Kordofan and Sennaar. He did not meet with it on the Upper White Nile, nor in the highlands of Habesh, but found it in all other parts throughout the year, though more common in the winter than in the summer. It extends down the east coast to the Cape, and has been procured on the west coast of Madagascar. It is, however, by way of the West Coast that it chiefly wanders south, for it is recorded from Bengal, Casamanza, and Accra. In this latter place Capt. Shelley met with it. In Gaboon and Benguela Professor B. du Bocage met with it; and in Damara Land it was procured by Mr. Andersson. Layard remarks that up to his time only one specimen had been killed in Cape colony by a Mr. Dumbleton, who obtained it on the Cape flats, where a pair only were seen.

Habits.—The extremely long legs with which this handsome bird is furnished enables it to wade in water where other species could not; and it consequently has a partiality for flooded marshes and swampy land, the edges of shallow, though not weedy tanks, and such like, where it may be seen stalking about, sometimes in comparatively deep water, every now and then thrusting its bill into it and picking up some minute crustacean or aquatic insect. The body is held erect, the neck slightly drawn back, and the bill nearly horizontal when it is walking. It associates in small flocks of a dozen or more, the members of which feed in scattered company, but form at once a compact body when the flock is put on the wing; the flight is performed with quick, regular beatings of the wings, and is not very swift, though steady and straight-on-end; the long red legs are carried straight out behind and at full extent. In the breeding-season it is very watchful and extremely noisy. Long before the intruder is near the breeding-ground he is sure to be made aware of the presence of these Stilts by their rising up in the air and hovering or supporting themselves with quick flapping of the wings, progressing slowly forward over the ground containing their eggs and young;

after remaining in this position for perhaps five minutes they start off and take wide circles, screaming all the while until they return again and hover over their nests. Their note is a harsh but not unmusical monosyllable quickly repeated; and, as Layard remarks, when a number utter it together the effect is not unpleasant. The young birds as soon as they are able to fly about adopt the same tactics as their parents, and have just the same note as they fly round the breeding-grounds. The sound may perhaps be best rendered by the words *gurnēet*, *gurnēet*, *gurnēet*, uttered in a brassy tone. I have found the diet of this species to consist largely of small shells, particularly a tiny univalve, numbers of which I have detected in a perfect state in the stomachs of specimens, mixed with minute crustaceans and very small insects. Von Heuglin, who notices the sedate manner in which the Stilt stalks about, says it catches flies and beetles quite as well as small fish, with which he has found the stomachs of some crammed. They are hard-lived birds, and, considering their comparatively weak frame, are somewhat difficult to kill, unless hit in the neck. I have known one fly a considerable distance badly wounded before it fell. Out of the breeding-season they are rather shy; but on the nesting-grounds they will fly round and round the intruder's head, displaying but little fear in their anxiety for the safety of their young. Pallas notices a singular habit which he observed in Central Asia, where they were to be seen dancing together, jumping up with expanded wings.

Nidification.—In the Hambantota district, where large numbers of these birds breed on the dried-up flats of the leways during the salt-gathering season, the nesting-time is in June and July, at the end of which former month I have found nestlings. On the occasion I refer to, when the young chicks were pursued they took to the water from a little embankment covered with weed, which ran out into the lake, and swam like ducklings; on the ground they ran with extraordinary swiftness, and it was with the greatest difficulty that I could catch one, so adroitly did it dart hither and thither as I put out my hand to seize it. The nest is usually made in a hole scooped in the ground, or in a little natural hollow about six inches in diameter, and the lining depends on the materials nearest at hand. At Hambantota a nest made on the flat foreshore of the lake was lined with small pieces of shells. At Minery Lake a nest situated on meadow-land, about 50 yards from the water, was entirely constructed of dry lichens, with which the grass was mixed, and which, in the wet season, flourished beneath the water. It was rather a deep cup, and contained the usual four eggs. This nest was found on the 10th of July. At Kanthelai, where there was, in 1874, a large breeding-colony of these birds, the nests were all found on an island which was, in the dry season, joined to the mainland. Many nests were built in a circle of flood-wreck, with which the highest part was surrounded, and were composed of the dry weeds, grass-bents, rubbish, &c. of which the "wreck" consisted: some were among scanty grass on the shingly ground, and had no lining save the gravel of which the soil was composed; others were among the outcropping edges of a stratum of rock, and were made entirely of sticks, mixed with a few grass-stalks; some, again, were on the flat land, and made of small twigs gathered from the flood-wreck. Long before we reached the place the Stilts came out to meet us, as is their custom, clamouring round our heads with loud cries, and continued this flying backwards and forwards until we reached the egg-ground, when they mostly all flew off, and settling at the edge of the water began to feed. The eggs in the large series I took on this occasion varied much in size, shape, and markings. The usual shape is pyriform, the obtuse end being nicely rounded; but many were flattened at that end, and others the same at the small part. The largest egg found measured 1.96 by 1.29 inch, and was of a dark stone-colour, covered with large hieroglyphic-like blotches and streaks and a few light brown irregular lines. In the same nest was a very small egg of the same character, measuring only 1.59 by 1.28 inch, and very flat at the obtuse end. The prevalent colour was an ochraceous stone tint, the eggs of this type being marked with irregular-edged blotches of blackish sepia, generally more or less confluent at the large end, and mixed with a few underlying marks of a paler tint. Others are stone-yellow, openly blotched, the markings being not so jagged at the edges. Others are quite green, covered throughout with small blots and markings. Some of the stone-yellow eggs were marked with a few large blotches or clouds of blackish sepia. The number varied from three to four in each nest, and they were generally found placed with the small ends together. The variation in size was from 1.96 to 1.32 inch in length by from 1.29 to 1.17 in breadth.

In India the breeding-habits of the Black-winged Stilt are somewhat different. The season there is

from April to June; and the only localities where they are known to breed are the salt-works in the Goorgaon district near Delhi, a locality called Toomulgoodiun near Secunderabad, and the salt lake of Sambhur. Mr. Hume says "they collect together small pieces of *kunker*, or the broken lime lining of the pans, into a circular platform, from 7 to even 12 inches in diameter, and from 2 to 3 inches in height; on this, again, they place a little dry grass, on which they usually lay four eggs." These nests are situated on small strips of ground from a foot to five or six in width, which divide the salt-pans or collecting-spaces from one another, and they are placed close together, as many as twenty-seven being found in one strip 100 feet long. "So accustomed," writes the author in question, "were the birds to the workmen walking up and down the middle of this strip that many of the birds never moved, though we passed within inches of them; and those that did move merely stalked leisurely a few paces away into the salt-pans on either side." The eggs varied as much as they do in Ceylon, and the average of a large series was 1·64 by 1·21 inch.

Eggs of this species, which I have examined in Mr. Dresser's collection, and which were taken in Europe, are similar in marking to mine—ochreous stone and olivaceous stone in ground-colour, and handsomely marked with blackish sepia, taking, in some specimens, the form of large handsome blotches, and in others of smaller, rather streaky-edged spottings. Dimensions as follows:—1·72 by 1·28 inch; 1·71 by 1·26; 1·74 by 1·25.

Genus RECURVIROSTRA.

Bill long, slender, hard, curved upwards to the tip, which is very thin and pointed; both mandibles channelled. Nostrils linear. Wings long and pointed. Tail rather short. Legs long and slender; tibia bare much above the knee; anterior toes united by a moderately-developed web, which is notched in the centre; hind toe minute, but perfect and with a claw.

RECURVIROSTRA AVOCETTA.

(THE COMMON AVOCET.)

Recurvirostra avocetta, Linn. Syst. Nat. i. p. 256 (1766); Gould, B. of Eur. iv. pl. 368 (1837); Blyth, Cat. B. Mus. A. S. B. p. 265 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 706; Schelgel, Mus. P.-B. *Scolopaces*, p. 105 (1864); Layard, B. of S. Africa, no. 617 (1867); Swinhoe, P. Z. S. 1871, p. 405; Holdsw. P. Z. S. 1872, p. 475; Shelley, B. of Egypt, p. 260 (1872); Hume, Str. Feath. 1873, p. 248; Adam, *t. c.* p. 397; Gould, B. of Gt. Brit. iv. pl. 53; Harting, Ibis, 1874, p. 245; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1175 (1874); Dresser, B. of Europe, pt. 46 (1875); Irby, B. of Gibraltar, p. 164 (1875); Blanford, Zool. Persia, p. 286 (1876); Butler & Hume, Str. Feath. 1876, p. 18; David & Oustalet, Ois. de la Chine, p. 461 (1877); Blakiston & Pryer, Ibis, 1878, p. 220; Hume, Str. Feath. 1878, vii. p. 289; id. *ibid.* 1879, viii. p. 113 (List of Ind. B.).

Recurvirostra europæa, Dumont, Dict. des Sc. Nat. iii. p. 339 (1816).

Recurvirostra tephroleuca, Vieillot, Enc. Méth. p. 360 (1823).

Recurvirostra sinensis, Swinhoe, Ibis, 1867, p. 401.

Avocette, Brisson; *Scoping Avocet*, Lath. & Pennant; *Säbelschnäbler*, German; *Boceta*, Spanish (Saunders); *Alfayate*, *Frade*, Portuguese (Smith); *Halebi*, Arabic (Von Heuglin); *Bou-mehet*, Moorish (Favier). *Shiloclukka*, Russians in Central Asia (Prejevalsky); *Kusya chaha*, Bengal. (Jerdon).

Adult male and female (China). Length 18.0 inches; wing 8.7 to 9.2; tail 4.0; tarsus 3.0; middle toe (without claw) 1.5; bill, measured straight from base to tip, 3.2 to 3.5. The larger dimension relates to males.

(Europe: Brit. Mus.) Wing 8.7 inches; tail 4.0; tarsus 3.2; bare tibia 2.8; middle toe 1.5; bill at front (straight) 3.3. Another example has the bill at front (straight) 3.0.

Iris red or brownish red; bill blackish horn; legs and feet bluish grey; "soles of the feet tinged with buff" (*Harting*). (Athens.) Plumage white; top of the head, including the lores and upper part of the face, the hind neck, shorter scapulars and an adjacent dorsal patch, lesser and median wing-coverts, tertial feathers, and the primaries, black; this colour descends down the hind neck in a broad band of half an inch in width. In birds which are not fully adult the central tail-feathers are sullied with brown.

Young. The bill is stated at first to be straight (*Cullen*); but it appears to assume the curved shape after a few days.

Nestling in down. Bill at front 0.68 inch; tarsus 1.12. Dusky grey above, with an irregular band down the centre of the back, and a stripe on each side of the rump; the back also mottled openly with brown; a thin stripe through the lores and behind the eye.

Further stage, back and wings feathered. Head and nape brown; hind neck and back fulvous tawny; scapulars white outwardly; an angular patch of brown on the interscapulars; the tips of the feathers buff; wing-coverts and tertials brown, margined with buff; secondaries white; primaries black; face and all beneath white. Bill at front 1.75 inch; tarsus 1.75.

Immature birds have the black parts sullied with brown and the central tail-feathers brownish.

Obs. This interesting genus comprises three species besides the present, two of which are peculiar to America, and the third to Australia. *R. americana*, Gmelin, which inhabits North America, south of Hudson's Bay, including California, and extends into Mexico and Central America, is distinguished from the present by having in the summer the head and neck pale sandy red, blending into the white on the chin and forehead, and below into the

white of the chest and back. In the winter the red parts are pure white, and in the autumn they are said to be grey. An example in the national collection has the wing 8·6 inches.

The other American species forms one of the most interesting cases of isolated habitat among the whole order of Waders. It is the *R. andina* of Messrs. Philippi and Landbeck, and was obtained at the Lake of Paruncota, in the Andes, at an elevation of 16,000 feet, in June 1863, by Herr Froben. As regards the head and neck it resembles the species just named in winter plumage, but has the entire wings, mantle, and tail black. The wing is given as measuring 9·6 inches.

R. novæ-hollandiæ, Vieillot, from Australia and New Zealand, has the entire head, throat, and chest rich chestnut-red at all seasons, sharply defined against the white of the breast; the primaries, greater and median coverts, and the inner series of scapular-feathers black. The wing of a specimen in the national collection measures 9·0 inches; tarsus 3·5.

Distribution.—This well-known and widely-dispersed species was obtained many years ago near Jaffna, and is, perhaps, a not unfrequent straggler to Ceylon. Layard, who records its occurrence, says:—"A pair of these birds were shot by my esteemed friend D. Quinton, Esq., at Chundicolom, near Jaffna, on the estuary." I have not heard of its having since been observed in Ceylon; but, as it is only a cool-season visitant to these low latitudes, it may easily escape observation during its sojourn in Ceylon.

In India it is not a numerous bird, but is widely diffused throughout the coast-districts, particularly of the northern part, though it does not seem to extend to the countries beyond the Bay of Bengal, mustering in greatest force in the north-west. About Calcutta, on the Hooghly and Ganges, it occurs yearly, appearing, according to Mr. Hume, in the market generally in March. Col. Tickell met with it on the Hooghly below Calcutta and at the mouths of the Roopnarain; but he states that inland, on the Ganges and its tributaries, nor on the Mahanadi, he never met with it. Jerdon, however, must have met with it in the interior, as he asserts that it frequents the edges of tanks and rivers; and Mr. Hume writes that they are "seen on the banks of rivers and large pieces of water" in Upper India. He met with it in the smaller tanks of the district of Jodhpoor in January 1878, during a drought which had lasted for fifteen months previous to his visit. In the cold season of 1873-74 large flocks visited the Sambhur Lake, although during previous years this had been rare in that district (*Adam*). In Sindh Mr. Hume found it common and associating in large flocks at the inland sheets of water, especially the Muncher Lake. In the Thurr, Pakur, and Cutch districts he states that

is comparatively rare; but in the neighbourhood of Decsa it is more common, as he writes that "he once, towards the end of April, saw a flock of fully one hundred on a small village pond, a mere puddle, below one of the bungalows between Decsa and Ahmedabad." In the same locality Capt. Butler records it as occurring "either singly or in small parties." It occurs in Persia, where Mr. Blanford procured it at the Shiraz Lake (4700 feet) in June; here Major St. John met with it, as also at the lake of Dastarjin. In Palestine it is a resident, according to Canon Tristram, but scarce; and in Arabia Mr. J. K. Lord met with it. It breeds, says Severtzoff, in the north-western and north-eastern districts of Turkestan up to an elevation of 1000 feet above the sea. Though it does not extend apparently to the northern parts of Siberia, where it has not been noticed by Messrs. Finsch, Seebohm, or Von Middendorff, nor yet in Amoor Land, it is found, according to Pallas and Radde, in Southern Siberia, Mongolia, and Tartary; and Col. Prjevalsky states that it "is a tolerably common spring migrant to South-east Mongolia, about the end of March, when it principally keeps to the shores of saltwater lakes, in small flocks of five to fifteen individuals. . . . We found it breeding on the Yellow River, and noticed that the first birds arrived in spring in Koko-nor on the 17th of March, where they were not scarce throughout the month." He did not see it in the Ussuri country. Père David likewise says that it breeds sparingly on the banks of the Hoang-ho or Yellow River.

It appears to be rare in Japan; Messrs. Blakiston and Pryer instance its occurrence at Susaki, in Tokio; and Temminck and Schlegel include it in the 'Fauna Japonica.' Swinhoe says that it occurs on the coast of China in winter, extending to Formosa and Hainan. This appears to be the limit of its range in this region, as it is not found in the Philippines nor in the Malay archipelago.

In Europe its habitat lies between lat. 60° and the Mediterranean. It breeds in the north of Germany and in Denmark and Holland, as also in some of the Frisian islands and the adjoining mainland, in which latter district Mr. Durnford met with it nesting in May 1874. It is common in Holland, and used to be so

in England, where it bred, prior to the drainage of the fens and other marsh-land, in Lincolnshire, Norfolk, Kent, and Sussex. It is more than thirty years since its eggs were taken in this country. In Ireland and Scotland it is a straggler, having occurred as far north as Orkney. It breeds in the south-east of Europe, where Dr. Cullen found it nesting in the Dobrudseha; in Macedonia it was observed by Col. Drummond-Hay, and Lord Lilford met with it in Epirus; in Transylvania it has occurred, but very rarely. In Sardinia it is not uncommon in winter; but in North Italy it appears to be seen chiefly in the spring; and in Malta and Gozo Mr. Wright met with it in spring and autumn. In Southern Spain Mr. Saunders found it breeding; but it is not numerous there, either according to this gentleman or Col. Irby, who testifies to its nesting near Seville; he never observed it near Gibraltar, but he gives Favier's assertion that it is a bird of passage in Morocco, occurring in March, April, and May, and on its return in November. Further south Canon Tristram met with it at Tuggurt, south of the Atlas, and on the borders of the Sahara. In Egypt it is a winter visitor, is moderately abundant, and inhabits suitable localities throughout Egypt, Nubia, and Kordofan. Von Heuglin obtained it in Lower Egypt in May, and is of opinion that it may breed in the Nile delta. From Northern Africa it extends down both the east and west coasts of the continent, and finds its way to Cape Colony, where it is tolerably numerous, not a few breeding there, as also in Damara Land, where Mr. Andersson found young birds. It has been observed by Drs. Kirk, Hartlaub, and Livingstone in the Zambesi country; and the two former naturalists assert that it visits Madagascar. Layard (B. of S. Afr.) records it from Zeekoe Bay, Nel's Poort, and Beaufort, in Cape Colony, and writes subsequently in the 'Ibis' that a Mr. Ortlepp found them breeding near Colesberg, and that it had also been met with at Hopetown. In Damara Land, where Mr. Andersson says it is not uncommon at Walvisch Bay, Sandwich Harbour, Angra, &c., it has been found as far inland as Objimbinque and Ondonga. On the west coast higher up it has been met with at the Congo by Tuekey.

Habits.—This elegant and handsome bird frequents mud and sand banks, the shores of tidal rivers, oozy flats round salt lagoons, and backwaters and the borders of muddy tanks and pools in India. It is frequently seen in small parties; but towards the time of passage it congregates in large flocks, and is often very tame, whereas when feeding alone on rivers it is, according to Mr. Hume, just the reverse. It walks in compact troops, so that sometimes as many as a dozen have been killed at one shot. It searches for its food in the wet mud and ooze just left bare with the tide, or in shallow water, and takes up the worms, crustacea, minute mollusca, and aquatic insects, on which it feeds, with a forward and sideward motion of its curiously upturned bill. It is quite evident that it cannot probe the mud with the tip of the bill so very acute and recurved; but, in order to cover as much ground as possible, it shoots it forward and then sweeps it sideways, taking in its food. Mr. Dresser writes, concerning his observations of the American Avocet:—"A flock of, say, ten or a dozen would commence operations in a diagonal line, one rather before the other, exactly like mowers in a field; and they moved slowly onwards, scooping sideways in the water with their recurved bills in regular order, reminding one most forcibly of a gang of mowers. I have several times examined the stomachs of Avocets I have obtained, and never found any thing in them but a mass of stuff mixed up with tiny stones, and could never exactly make out of what it consisted, though it appeared, so far as I could ascertain, to be the remains of minute insects pounded up into an undistinguishable pulp." I gather further, from the observations of Mr. Hume during his visit to Sindh, that they are very active noisy birds, trotting about very rapidly with their whole bill immersed in the water, moving their heads from side to side as they trot along, and reminding one very much in their actions of the Spoonbill." The Avocet not unfrequently takes to the water, little flocks having been seen by different observers floating about as if for amusement or in order to rest themselves. Major Hayes-Lloyd remarks that he has frequently seen them swimming in Kattiawar; and Mr. Dresser writes:—"I have seen a flock feeding in shallow water; and when I have approached rather too close they would wade deeper until they got out of their depth, when they paddled easily across the narrow lagoon and commenced operations again in the shallow water on the other side."

Nidification.—The Avocet breeds in Europe in the months of May and June. In the former month it lays in Spain; and on the 30th of the same Mr. Durnford procured its eggs at Husum, on the coast of

Schleswig Holstein. In some regions it nests in marshes; but in others, such as the Dobrudscha, and apparently also at the Cape, it chooses sandy wastes and shingle, or the dried-up mud on the foreshores of salt lakes and lagoons. From Mr. Harting's interesting article on this species, contained in his valuable and exhaustive notice of the genus ('Ibis,' 1874), I transcribe the following particulars:—"The nest is usually a mere hollow lined with stems, straws, and pieces of eaked mud, but is frequently without any lining at all. Dr. Cullen once found some nests made completely of straws and stones built up to the height of 6 or 8 inches. When undisturbed the bird invariably lays four eggs. . . . Notwithstanding that the nest is generally in an exposed situation, it is not very easy to find; for the bird never flies directly to or from it. It always runs crouching along the ground, with head bent low, for some little way before it takes flight, and in returning it invariably alights first at some distance, and approaches the nest in the same cautious way that it left it. It is a shy and restless bird, and betrays great uneasiness if its nest is approached or its young molested, often trying to entice the intruder away by feigning lameness or a broken wing."

The eggs are very handsome, varying in ground-colour from a rich stone-buff or clay-yellow to light ochraceous stone: the markings are in general moderately small for the size of the egg, very dark, almost black, and sharp-edged, like blots of ink; they are distributed tolerably well over the whole surface of the egg, and are mixed up with small blots of bluish grey. In a series of sixteen before me, three are marked with small spots and two with large hieroglyphic-like blots, some of which are washed out in parts. In one egg there are a very few large blots of sepia-black, overlying small blots of bluish grey. In size this series varies from 1.85 by 1.38 inch to 2.04 by 1.38; one very broad specimen measures 1.94 by 1.43. In shape they are broad, somewhat pointed ovals, but not pyriform or compressed at the small end. With regard to the method of feeding the young by the parents, Mr. Harting considers it probable that the old birds bring the food "crosswise in their bills, and laying the latter close alongside the open mandibles of the young, allow them to snatch the food sideways from them;" for, as he remarks, owing to the weak attenuated tips of the bills both in the old and young the food could not be held in them, and their peculiar shape would prevent the bill of the parent being thrust into that of the young, as is the case with insectivorous birds.

GRALLÆ.

CHARADRIIDÆ.

Subfam. CHARADRIINÆ.

Bill short and moderately slender; the culmen compressed at the base, and the tip swollen. Wings long; tertials lengthened. Legs moderate and slender; toes moderate, outer and middle connected at the base by a web; hind toe wanting, except in one genus.

Of littoral habit. Mostly of small size, with a change of plumage in the breeding-season.

Genus SQUATAROLA.

* Bill straight, stout, thick at the base, terminal third hard, elevated and concave; gonys correspondingly inflated; nostrils linear, lateral, placed in a pronounced groove reaching to the horny tip. Wings long, pointed; the 1st quill the longest. Tail of 12 feathers, short and cuneate. Legs and feet strong; tarsus tolerably short and reticulate; outer toe connected to the middle at the base by a web; *hind toe minute*.

SQUATAROLA HELVETICA.

(THE GREY PLOVER.)

Vanellus helveticus, Brisson, Orn. v. p. 106. no. 4.

Tringa helvetica, Linn. Syst. Nat. i. p. 250 (1766).

Charadrius helveticus, Linn. Syst. Nat. i. p. 250 (1766), ex Brisson.

Charadrius squatarola (L.), Gould, B. of Europe, pl. 302 (1837); Von Middendorff, Sibir. Reise, ii. p. 209 (1853).

Squatarola helvetica (Linn.), Gould, B. of Austr. vi. pl. 12 (1849); Blyth, Cat. B. Mus. A. S. B. p. 262 (1849); Jerdon, B. of Ind. iii. p. 635 (1864); Gould, Handb. B. of Austr. ii. p. 224 (1865); Layard, B. of S. Afr. no. 562 (1867); Sharpe & Dresser, B. of Eur. pt. 6 (1871); Shelley, B. of Egypt, p. 236 (1872); Hume, Str. Feath. 1873, p. 228; id. ibid. 1874, p. 287; Adam, *t. c.* p. 338; Salvadori, Uccelli di Born. p. 313 (1874); Irby, B. of Gibraltar, p. 159 (1875); Walden, Tr. Zool. Soc. 1875, ix. p. 226; Hume, Str. Feath. 1876, p. 11; Scully, *t. c.* p. 184; Armstrong, *t. c.* p. 338; Legge, *t. c.* p. 245 (first record from Ceylon); Seebohm & Harvie Brown, Ibis, 1876, p. 222, pl. v.; Butler, Str. Feath. 1877, p. 222; Hume, ibid. 1878 (B. of Tenass.), p. 455; id. ibid. 1879, viii. (List Ind. B.) p. 112.

Pluvialis varius (Briss.), Schlegel, Mus. P.-B. *Cursores*, p. 53 (1864).

Charadrius varius (Briss.), Von Heuglin, Orn. N.Ost-Afr. ii. p. 1012 (1874).

The Swiss Sandpiper, Latham; *Vanneau-Pluvier*, Buff.; *Grey Sandpiper* of some; *Tarambola*, Portuguese; *de Goudkievit*, Dutch; *Kiebitzregenpfeifer*, German; *Chorlito*, Spanish (Sannders); *Redolin*, Spanish; *Krungi*, Amoor Land (Schrenck). *Chullo*, Turki (Scully); *Burra Batan*, Hind. (Jerdon); *Chilugan*, Java (Horsf.); *Abu hadjar*, Arabic (Von Heuglin).

Adult male and female (Ceylon). Length 12.0 to 12.6 inches; wing 8.0 to 8.5, expanse 26.5; tail 3.2; tarsus 2.0 to 2.1; middle toe and claw 1.37 to 1.4; bill to gape 1.3.

Iris dark brown; bill black; legs and feet dark greyish blue or plumbeous.

Winter plumage (Ceylon). Head, upper surface (with the exception of the tail-coverts), and wings dark glossy brown, the feathers tipped and marginally spotted with white, and the shafts black; on the scapulars and wing-coverts the spots are large and take the form of bars, the intervening spaces being blackish; greater coverts broadly tipped and edged with white; quills and primary-coverts glossy blackish brown, the coverts with broad, and the inner primaries with narrow white tips; the latter white across the centre, and the secondaries mostly white,

washed with brown on the terminal half; shafts of all the quills white, except at the tip; upper tail-coverts and three outer tail-feathers white, with black bars; remainder with alternate brownish-black and greyish-white bars; forehead, above the eye, chin, face, throat, and under surface white, the feathers on the face, fore neck, chest, and flanks with brown centres, narrow on the fore neck and face, and widened on the chest; on the upper flanks the markings take the form of bars, and in front and beneath the eye they are confluent; axillary plume and least under wing-coverts coal-black; lateral under tail-coverts barred with black on their outer webs.

Adult male and female (Europe; England). Length 10.5 to 11.0 inches; wing 7.4 to 7.6; tail 2.6; tarsus 1.7 to 1.8; middle toe and claw 1.35; bill to gape 1.3.

Male in breeding-plumage (May, Sussex). Lores, face, ear-coverts, chin, throat, chest, breast, and flanks coal-black, not passing round the eye, but extending just above the anterior corner (in some specimens the eyelid above is fringed with black); forehead and a broad band passing over the eye and down the border of the black neck to the sides of the chest, abdomen, vent, thighs, and under tail-coverts white, passing on the crown, nape, and hind neck into greyish; the feathers in these parts centred with black; back, rump, and wing-coverts chiefly dull black, the feathers tipped and laterally spotted with whitish grey, the latter markings on the wing-coverts extending towards the shafts and making these parts whiter than the back; primaries brownish black, the greater portion of the inner webs white, and the shafts with a patch of white near the tip; the shorter feathers with a white patch on the outer webs near the tip; secondaries white at the base, darkening into ashy brown on the inner and into blackish brown on the outer webs towards the tip; the elongated tertials ashy brown, indented with black and white at the margins of the outer webs; upper tail-coverts white, with marginal bars of black; tail white, barred with black (the centre feathers broadly) and also obscured with black near the tip, the extremities being white; the lateral under tail-coverts with marginal spots of black, and the white sides of the chest patched scantily with black; axillary plume black; under wing white. In some specimens the white almost predominates over the black on the upper surface. A male from Barcelona (May) exhibits this character, the white tippings and marginal patches being very broad, especially on the back.

Female in breeding-plumage. The black of the throat and under surface of a brownish hue; this is said to be normally the case: a specimen which I have examined, in Mr. Dresser's collection, in May exhibits this character; the dark markings of the upper surface are also brownish black. The black is acquired by a change of the feather, which can be plainly seen in *spring* examples; the alteration in colour commences at the tip and extends up the feather. In specimens I have examined I detect but few, if any, *new* black feathers, as in the next species.

Young, nestling in down (Petchora river, Mus. Seeborn). Top and sides of head, back, wings and rump, and outer side of thighs dull golden yellow, coarsely mottled with dull black; nape, hind neck, a patch on each side of the rump, and under surface dull white; down the centre of the forehead there is a straight stripe, as in the young of *Ch. pluvialis*, and there is a streak above and below the gape, as in *Ch. fulvus*. The chick is intermediate in marking between these two last named; and the conspicuous white hind neck, as well as the large bill and legs, besides the presence of a hind toe, would serve to identify it readily; the lower cheek-stripe encircles a white patch below the eye in all three species.

Immature (British Museum; Rocky Mountains). Head, nape, interscapulars, tertials, and wing-coverts blackish brown, palest on the wing-coverts; the feathers of the head margined with dull golden yellow, and those of the remaining parts in question with large marginal spots of the same; back much the same, but the spots less pure; tail barred black and white, the white changing near the tip into golden yellow; upper tail-coverts white, tipped with yellowish. Forehead, face, and throat dull white, streaked with black, which pales and blends with the whitish on the fore neck; sides of the chest marked with blackish brown and faint yellowish; beneath from the chest dull whitish.

Obs. In this plumage the Grey Plover is not unlike the Asiatic Golden Plover; but the yellow spottings are paler, and, to the inexperienced, the larger bill, *conspicuous black axillaries* (seen even in flight), and, *above all, the hind toe* will always serve as distinctive marks.

Distribution.—The Grey Plover has not been noticed in Ceylon until recently. I met with it at Illepekadua on the 10th March, 1876, and recorded its occurrence in 'Stray Feathers,' *loc. cit.* Two days afterwards I saw a small flock at Manaar. Mr. Murray, of the Ceylon Civil Service, subsequently informed me that he had often met with it at Jaffna, and that in some seasons it was tolerably common on the beach

near Batticotta and along the coast of the peninsula. In October 1876 I saw one on the beach at Chilaw, and in the following month I acquired a specimen which was shot by a native at Kotte, near Colombo. The occurrences, therefore, which came under my personal notice fell within a single year; but as they extended over two seasons it is to be inferred that the species may possibly visit the island yearly in small numbers.

In India it has been principally noticed on the coasts of the northern portions of the empire; but Dr. Jerdon obtained it in the Madras market; and as it is one of the most cosmopolitan birds in the world, it is sure to occur all round the peninsular sea-board. It is chiefly a sea-coast species; but I find an instance of its occurrence inland in the Deccan, where the Rev. Dr. Fairbank observed it in flocks in the cold season. Neither Messrs. Ball nor Cripps say any thing of it; but Mr. Hume remarks that a few are seen yearly in the Calcutta market. In the Irrawaddy delta Dr. Armstrong met with it only along the sandy portions of the beach between Elephant Point and China-Bakeer, where it was not uncommon. In Tenasserim it is rare; Captain Wardlaw Ramsay obtained it at Tonghoo, and Dr. Armstrong at Amherst. It is found, but not commonly, at the Andamans, occurring at Macpherson's Straits and at Port Mouat, and was procured by Capt. Wardlaw Ramsay at South Andaman. In the north-west of India Mr. Hume found it abundant in Kurrahee harbour and along the Sindh coast in the cold season; Captain Butler has seen it there during the hot weather, and he likewise remarks that it is abundant at Mandavee in the gulf of Cutch. Inland it only occurs during migration in autumn and spring. A remarkable instance of its occurrence in *September* in full breeding-plumage is noted by Mr. Adam, who obtained such a specimen on the 25th of that month at the Sambhur Lake. This must have been an individual which migrated south before moulting, or one which acquired its nuptial dress after its migratory impulse had died out for that year.

In Turkestan Severtzoff says that it occurs rarely in the south-eastern district up to 1000 feet elevation; and in Kashgar Dr. Scully met with two examples in November, but did not see any thing more of the species. It summers in Northern Asia; but I do not see any record of its having been observed in North-western Siberia nor on the Ycuesay. Towards the east, however, Von Middendorff met with it in very high latitudes, and found it breeding in the Byrranga mountains in lat. 74° , and on the Boganida river in lat. 71° ; but it was not seen in those northerly regions before the 24th of May. In Amoor Land Von Sehrenck met with it; and in Japan it is common, inhabiting also in summer the peninsula of Kamtehatka. It passes down the coast of China in winter, is found in Formosa and Hainan, and extends across to the Philippines, where it has been obtained in Cujo and Negros. Southward in winter it migrates through the Malay islands to New Guinea and the continent of Australia as far as Tasmania. In regard to the first-named region it has been obtained by several naturalists in Java and Borneo; and in Labuan it was procured by Messrs. Mottley and Dillwyn, while recently Governor Ussher brought it home from Brunei river and Moara Island. In Timor, Wallace and Bernstein met with it; and from New Guinea it is recorded by Müller. In Mr. Ramsay's new list of Australian birds it is noted as being found at Roekingham Bay and all the southern colonies, as well as in the Richmond and Clarence-river districts. I do not find it recorded from New Caledonia or any of the islands of the Pacific, so that it does not seem to extend eastward of New Guinea. Returning to the west of Asia and Europe, we find Canon Tristram recording it as a winter resident in Palestine; and Robson as not uncommon in Asia Minor in autumn, a few staying throughout the winter. Lord Lilford procured it in the Epirus; and Lindermayer and Von der Mühle record it from Greece. In Malta, Sicily, and Sardinia it is a winter visitor; and in Spain, according to Mr. Saunders, is more common on passage than in winter; he obtained it in May in breeding-plumage in Malaga. In Portugal it is said to be common. In the Gibraltar district Col. Irby says that it arrives in November, and, though frequently seen in autumn and spring, is not at any time abundant. On the 22nd May he obtained a pair at the mouth of the Guadiarro, the male of which was in full summer plumage, an unusual occurrence so far south. About this time it is passing north through Central European districts to its breeding-home on the Arctic circle. In Transylvania it occurs on migration but rarely; further east it appears to pass through Southern Russia and up the Volga, being noticed in occasional seasons in the Kasan district. From here Messrs. Seeböhm and Harvie Brown say that it probably passes down the Petchora to about the mouth of its tributary the Ussa, and then spreads over the vast tundras to the north-east, on which these enterprising naturalists were so fortunate as to take its eggs a few years since. The latter author met with it likewise near Archangel,

but was told by the inhabitants that they did not breed there. There is much yet to be learnt concerning its breeding-home, for we have yet to discover the whereabouts in the nesting-time of those which migrate up the Baltic from Western Europe. Herr Collett asserts that it breeds in the mountains of Finmark; but I am not aware that its eggs have been procured in that country. Mr. Durnford met with Grey Plovers in pairs at Husum and in the island of Sylt at the end of May; but these were, it is to be presumed, on passage.

Leaving the continent of Europe and referring now to its African distribution, I find that, according to Col. Irby, Favier states that it is seen about Tangier from December until March; and Mr. T. Drake likewise records it from Morocco. It has been noticed in Algeria; and in Egypt it is distributed throughout the Delta and north coast in winter; and Von Heuglin says it is found along the coast of the Red Sea and in Kordofan; he observed it as late as April. It extends down both sides of the continent to the Cape of Good Hope, and spreads eastward to Madagasear and the Seychelles, from both of which regions Mr. E. Newton records it. Captain Sperling noticed it as being common at Zanzibar; and in Natal Mr. Ayres procured it. Layard writes that he never saw the Grey Plover in Cape colony in breeding-dress, but that he procured many specimens in winter dress there and along the east coast as far north as 12° south. In Damara Land Mr. Andersson obtained it in winter. Further north it has been obtained in Gaboon, as also on the Gold Coast and in Senegambia; and in the Canary Islands it has also occurred.

Its distribution in America is almost as extensive as it is in the Old World, for it is found from Greenland, where it was met with in summer by Reinhardt, down the coast to the West Indies, where it has been obtained in Jamaica, Cuba, Trinidad, and the Bahamas. In Guatemala Mr. Salvin met with it at Chiapam; and in Texas Mr. Dresser procured it in autumn and spring.

Habits.—This most cosmopolitan of all the Plovers is quite a sea-coast species, frequenting sea-beaches, the sandy shores of inlets and river-mouths, tidal flats, and other situations on the immediate sea-board. It associates usually in small troops of six to a dozen, and is often met with singly, consorting then with the Sand-Plovers (*Ægialitis*). Its greater size and its large head and bill will always serve to distinguish it when feeding from the Golden Plover of Ceylon; and when on the wing, passing the observer, its black axillaries forming a conspicuous tuft are at once recognizable, and easily distinguish it from its lesser ally. I found it, on the few occasions on which it came under my observation in Ceylon, a shier bird than the Golden Plover, inclined to be wary and impatient under observation. The specimen I killed at Illipekadua was feeding at a little distance from some Sand-Plovers at the edge of a pool in the tidal flat, and was knocked over at a long shot as it rose and flew round me. Its flight is somewhat heavy; and I noticed that a small troop which passed me in a pour of rain flew slowly and close together, forming a compact flock.

Nidification.—Until lately the breeding-haunts of the Grey Plover remained almost undiscovered; but ornithologists are now indebted to those indefatigable travellers, Messrs. Seebohm and Harvie Brown, for a knowledge of its nidification and an acquaintance with its eggs. These gentlemen found this species breeding in the great tundras lying between the Petchora river and the Ural mountains. Von Middendorff had previously brought eggs from Northern Siberia, but had not published any details concerning its nesting. Nests were found on the Petchora from the 22nd of June to the 12th of July, the places chosen for them being low-lying boggy tracts on the tundra in preference to the higher and more undulating parts of it. They were "simple shallow depressions in the moss or peaty soil, lined with a small handful of broken twigs and leaves of the surrounding plants." Mr. Harvie Brown writes that the bird's behaviour near the nest was similar to that of the Golden Plover, "sitting erect on the higher hummocks, running rapidly across the hollows, whistling at intervals, then flying in a wide circle round the nest—not, like the more cautious Dotterel, running round the hummocks or grey stones, pausing in the hollows, silent, running over a ridge out of sight, head down, and reappearing from a diametrically opposite direction." Concerning the bird's voice and other habits during the breeding-time, we learn that the notes are "three in number:—*first*, the call-note between male and female, a double whistle, the first syllable short, the second drawn out; *second*, the alarm-note, a single plaintive whistle, about half a note higher than that of a Golden Plover; and, *third*, a treble

whistle, the second syllable having a lower intonation than the first and third. This latter is not so commonly used, and appears to be the call-note of the males to one another when flying apart from the females, and is generally uttered when the birds are flying high in the air. The males associate in small parties of three and four; and a peculiar phase of flight is then observable. They rise to a great height and dash about in erratic curves, or diving down impetuously, rapidly rise again; they then remain almost stationary like a Temminck's Stint, raising the wings over the back until they nearly meet, and finally, flying with long Tern-like sweeps of the wings, utter their musical treble note." A fine series of eggs in the collection of Mr. Seebohm, which I have examined, vary in ground-colour, being olive stone, greyish stone, and yellowish stone-colour, the grey eggs having the smallest markings. They are blotched and clouded boldly on the larger half, and chiefly round the end, with irregular-edged blotches of blackish sepia, running mostly in a longitudinal direction; the markings are smaller near the minor end, and beneath the dark colouring are smears and traces of bluish grey. In shape some are rather pointed and others slightly rounded at the small end. They vary in length from 2.15 to 1.96 inch, by from 1.42 to 1.41 respectively in breadth.

Genus CHARADRIUS.

Bill much as in *Squatarola*, tip not so elevated, and gonys less pronounced. Wings and tail as in that genus. Legs and feet moderate; toes furnished with a narrow lateral membrane, as in the last; outer toe united at the base to the middle; hind toe wanting; claws straight and concave.

CHARADRIUS FULVUS.

(THE ASIATIC GOLDEN PLOVER.)

Charadrius fulvus, Gmel. Syst. Nat. i. p. 687 (1788); Sharpe & Dresser, B. of Eur. pt. 9 (1871); Swinhoe, P. Z. S. 1871, p. 403; Holdsw. P. Z. S. 1872, p. 470; Hume, Str. Feath. 1873, pp. 228, 462, et 1874, p. 287, et 1875, p. 179, et 1876, p. 463, et 1878 (B. of Tenass.), p. 455, et 1878, vii. p. 482, et 1879 (List B. of Ind.), p. 112; Buller, B. of New Zealand, p. 202 (1873); Legge, Ibis, 1874, p. 27, et 1875, p. 400; Salvadori, Ucc. di Born. p. 313 (1874); Hume, Nests and Eggs, iii. p. 570 (1875); Butler & Hume, Str. Feath. 1876, p. 11; Armstrong, *t. c.* p. 339; Ball, *ibid.* 1878, vii. p. 226; Seebohm, Ibis, 1879, p. 153.

Charadrius xanthocheilus, Wagler, Gould, B. of Austr. vi. pl. 13 (1848).

Charadrius longipes, Temm. apud Bonap. Rev. Crit. p. 180 (1850); Jerdon, B. of Ind. iii. p. 636 (1864).

Charadrius pluvialis, Linn., Sykes, P. Z. S. 1832, p. 166.

Charadrius virginicus, Bechst., Blyth, Cat. B. Mus. A. S. B. p. 262 (1849); Kelaart, Prodrömus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.

The Marbled Plover, Kelaart; *Chnipe*, Dutch in Ceylon; *Sneppy*, Portuguese in Ceylon; *Trull*, Java (Horsf.); *Cheruling*, Sumatra (Raffles); *Sintar*, Borneo (Mottley); *Kotan*, Tamils in Ceylon; *Chota battan*, Hind. (Jerdon).

Rana watuwa, also *Oliya*, *Maha oliya*, Sinhalese.

Adult male and female (Ceylon). Length 9.3 to 10.0 inches; wing 6.2 to 6.75; tail 2.3 to 2.6; tarsus 1.6 to 1.85; middle toe and claw 1.2 to 1.25; bill to gape 1.05 to 1.1.

Male (Eastern Bengal). "Wing 6.8 inches; tarsus 1.66; weight 4.87 oz." (*Cripps*.)

Winter plumage (Ceylon). Iris dark brown; bill blackish, gape and base beneath yellowish, in some blackish leaden with the entire base pale; eyelid olive-brown; legs and feet plumbeous, varying in depth of colour.

Top of the head, back, rump, and longer scapulars dull black, paling on the hind neck, wing-coverts, and tail to brown, the greater coverts being lighter than the rest; the feathers of the head have broad lateral margins of golden yellow, and those of the back, rump, and scapulars lateral and double terminal spots of the same; the paler portions are similarly spotted with a lighter hue, those on the wing-coverts and tail being whitish; greater coverts and lateral tail-feathers tipped and edged with white; quills blackish brown, narrowly tipped, as are the primary-coverts, with white; the central portion of the shafts white; forehead, face, and throat whitish, paling into pure white on the breast and belly; the face, fore neck, and chest with dark centres to the feathers, and the flanks barred with the same hue; on the chest the brown centres are broadest, imparting a dark appearance to it; *axillary plume dark grey*; lateral under tail-coverts with brown marginal spots.

Breeding-plumage (Yenesay river). Wing 6.3 inches; tarsus 1.7; bill to gape 1.1. Under surface from the vent to the chin black, covering the ear-coverts and entire face, and passing round the eye and over the lores across the base of the forehead for about $\frac{1}{20}$ inch from the bill; flank-feathers white, barred with black, and the upper series, next the chest, tinged in places with yellow; the head, occiput, back, and scapulars blacker than in winter plumage, and the spottings of a brighter golden yellow, and many of the tips of the feathers whitish; across the forehead, just above the black, is a broad band of white, passing over the eye and above the ear-coverts down the side of the neck to the flanks; the dark portions of the wing-coverts and tertials are black and the markings yellower than in winter; under tail-coverts white, the shorter feathers patched with black, and the lateral feathers

barred with it on the outer webs; the primaries are scarcely any blacker than in winter, but the shafts at the base are much darker, and there is less white towards the tips.

The markings in some specimens are much more golden than in others; but the specimen above described has the upper-surface feathers tipped with white in an exceptional manner.

The summer dress begins to be assumed in Ceylon about the middle of April, and before the birds have left the island they may be procured in every stage of change almost to the complete black plumage. A male shot at Galle on April 29, 1871, has the face and under surface nearly uniform black, a few of the feathers on the upper part of the throat, and here and there on the breast, being parti-coloured; the white band on the forehead and down the sides of the neck is fully developed, and all the upper-surface markings bright golden yellow.

The breast is the first part to change, and becomes tolerably black before the black face and throat and the white forehead are assumed. As I remarked in the 'Ibis' for 1874, the black under plumage is assumed, to a considerable extent, by a change of colour in the feather; black marginal spots appear near the tips of the breast-feathers, and quickly coalesce until the terminal half, all but the extreme tip, becomes black; the white margin then turns; these feathers may be distinguished from the new-moulted feathers, which are entirely black, and of course encased in the usual manner at the shaft.

Young, nestling in down (Yenesay river, July 22, 1877; mns. Seeböhm). Above mixed velvety black, golden yellow, and white; the black markings in the form of bold blotches and conspicuous mottlings; forehead and lores white, with a cross-shaped black mark; an irregular band of white across the hind neck, joining the white throat and fore neck; above and below the gape there is a black line running back to the ear-coverts; under surface greyish white. Tarsus 1.4 inch, bill to gape 0.8; bill black; legs and feet wood-brown.

The first plumage is very similar to the adult winter dress; but the spots on the upper surface are smaller and less bright, and the under surface is sullied with grey; the ground-colour of the head and back is not so dark as in the adult.

Obs. This species was first confounded with the European bird *C. pluvialis*, and was afterwards thought to be the same as the American race *C. virginicus*. It afterwards received a title of Temminck's, applied to it by Bonaparte, and was finally demonstrated to be the same as the Malasian and Australian species, *C. fulvus*.

It differs notably from *C. pluvialis* in having the axillary plume and under wing *grey* instead of pure white, in having longer legs and a proportionately larger bill. The European bird has also a different character of marking on the upper surface, more easily understood at a glance than from description on paper. A specimen in breeding-plumage from the Yenesay, shot by Mr. Seeböhm, has a greater number of marginal yellow spots on the upper-surface feathers than are present in the Asiatic race, and the tertials are marked with regular oblique marginal bands instead of spots as in our bird; the black frontal band is slightly broader; the bands of the central tail-feathers are yellower and more complete than in our bird.

The nestling *C. pluvialis* is quite differently coloured, being *finely* mottled with golden yellow and black on the upper surface, without the nuchal white band; the forehead is without the cross-shaped mark, and the cheeks are mixed brown and yellow. Tarsus 1.2 inch; bill to gape 0.62. In these measurements even the chick is well marked.

C. virginicus has the axillaries dark grey, as in *C. fulvus*, but is larger.

Distribution.—The Asiatic Golden Plover arrives in Ceylon in great numbers in the month of October; but in some seasons considerable flocks reach the island nearly a month earlier. I have met with it in the south of Ceylon near Waackwella as early as the 10th of September. In 1875 they first made their appearance at Trineomalie about the 5th of October, at which time they were to be seen frequenting isolated rocks in the harbour and about the sea-coast, previous to overspreading the interior. In a few days they disappeared from these marine localities, and took up their usual habitat in open places along the sea-board and inland swamps and fields. Mr. Holdsworth remarks that they arrive in the Manaar district (Aripu) in August, many of them still wearing traces of their summer dress; and this I have noticed in September specimens at Galle. During the season of its sojourn in Ceylon it wanders about a good deal in wet weather, appearing in places after a heavy night's rain in November, December, and January where it is never seen in dry weather. On such occasions it makes its appearance in public places near the sea, such as the Galle face at Colombo, and the esplanades at Galle, Jaffna, and Trineomalie. I have met with it in suitable localities in all parts of the northern, north-eastern, and north-western districts which I have visited; and the same may be said of the low country in the west and south of the island. It is very abundant between Waackwella and Baddegama,

frequenting the open cultivated district on each side of the Gindura river. In the south-east of the island it is met with numerously about the leways, near estuaries and salt lagoons; and on the east coast and to the north of Trincomalie finds a home in similar localities. I noticed it in abundance in March in the Jaffna peninsula, and met with it in great numbers all down the north-west coast, from Jaffna to the Puttalam district. It frequented the flats on the sea-coast, and consorted much with the Turnstone in some localities, such as the Erinativoc Islands and the Manaar sands, being particularly abundant in those places. It ascends the hills from the Eastern province, having been met with on the Uva patnas near Banderawella, at an elevation of 4000 feet; and it is not improbable that it occurs as a straggler about the Nuwara-Eliya lake. It leaves the island early in May, and on the 28th of April I have shot it at Wackwella in almost perfect breeding-plumage.

In India it is found principally in the north-east, appearing to be rare both inland, on the Deccan, and in the north-western districts. It has been recorded by Mr. Blanford from Bombay; but the Rev. Dr. Fairbank did not meet with it in the Khandala district. In Kattiawar it is abundant; but in Sindh, Guzerat, and Jodhpur it is rare. In the former province Mr. Day met with it at Larkhana, and in the second-named Captain Butler met with it singly or in small parties, and did not observe it until October, so that it must extend across the country from Bengal, and not migrate direct from the north; and this is proved by the fact that Mr. Blanford did not notice it in Persia (though it has been seen on the Mekran coast), nor Severtzoff in Turkestan. Dr. Stoliczka observed it during the first half of the winter at Yarkand; but Dr. Scully did not see it at all. Its habitat, therefore, beyond the north-west of India is very limited. In Raipur it is said to be very abundant in stony plains, leaving them about the 1st of May; and Mr. Ball likewise records it from Orissa on the north and south of the Mahanadi river, and also from the Godaveri valley. Writing of it in regard to the Calcutta district, Mr. Hume says that in the beginning and end of the cold season they are brought into the market in "enormous numbers, and that on the 26th April they were all in breeding-plumage; about the 16th May they all disappear." Mr. Cripps, who says that it is very common in Furreedpore, has noticed it as early as the 10th August and as late as the 10th of May. In the Irrawaddy delta it was found by Dr. Armstrong to be common along the shore, but more abundant inland in ploughed fields. In Tenasserim it is common, and is found on the open and cultivated-plain portions of the entire province; it leaves, says Mr. Davison, in May. Regarding the Andamans, Mr. Hume procured it at Preparis and Cocos, and saw it at many of the other islands. Mr. Davison found it abundant in South Andaman and on Camorta in the Nicobars: he remarks that it arrives in November and remains until June; but stragglers are procured in the hot season in non-breeding plumage, these being evidently barren birds. On the opposite side of the peninsula it was met with at nearly all the islands of the Laccadive group.

It wanders south by way of the Malay peninsula and the coast of China (from which latter region and from the islands of Hainan and Formosa Swinhoe records it) to the Malay islands, and thence onwards to Australia; while to the east it spreads beyond the Philippines, where it has been obtained in Luzon, Negros, Mindanao, and Zebu (in the latter in full breeding-plumage in April), to the Pelew and other islands of the Pacific, among which may be mentioned Eua and Ninafou in the Friendly group, and Ponape, one of the Seniavins, whence it has been recently received by Dr. Finseh. Layard has procured it in New Caledonia, and writes ('Ibis,' 1879, p. 107) that his son found it breeding on some islands off Anseвата, which important information demonstrates that it is, in some degree, resident in the southern hemisphere. It has been found in more tropical latitudes in summer than the above mentioned, as Dr. Meyer procured it in the Togian Islands in 1871; and in Formosa Swinhoe states that it breeds in great numbers. The eggs, however, which he obtained in that island as belonging to the Golden Plover appear to be those of the Large Sand-Plover. It occurs in Sumatra (where Mr. Everett obtained it in the Lampong district), in Java, Borneo, Labuan, Celebes, Bouru, Amboyna, Ceram, Batchian, Halmahera, Morotai, and Timor. In Borneo it is, according to Mr. Mottley, very common; and it is recorded from numerous localities. It was procured by Forster in Celebes; and Herr Müller obtained it in New Guinea, from the south coast of which island Mr. Ramsay of Sydney likewise records it. He likewise notes it as having occurred at Cape York, Port Darwin, the Gulf of Carpentaria, Rockingham Bay; whilst, as regards Australia generally, Mr. Gould observes, "Although nowhere very abundant, this bird is generally dispersed over all the colonies from Tasmania to the extreme north of the continent of Australia. I obtained several specimens on the banks of the Derwent in

Tasmania, observed it in small numbers on the flats below Clarence Plains, and also killed examples on one of the islands in Bass's Straits." In New Zealand, Mr. Buller says that it occurs occasionally as a straggler, and always in winter plumage.

Returning now to Central Asia, through which it evidently migrates from India to Northern Siberia, passing from the south by Assam and Thibet, we find that celebrated traveller Col. Prjevalsky writing as follows of it:—"In the beginning of May 1871 we noticed large numbers of this species during migration in S.E. Mongolia, close to Si-ins; they kept in large flocks about the newly-ploughed fields. In the following year we again met with some, on the 24th of April, in the Hoang-ho valley, but found them rather scarce. In autumn only a small flock was observed by us, in the beginning of September, in Northern Ala-shan; but, according to the statements of the missionaries, these birds are just as common about Si-ins in autumn as they are in spring. It does not inhabit Kan-su or Koko-nor; and only a few migrating specimens pass over Lake Hanka, about the end of August." On the Amoor specimens were procured by Von Sehrenck of a Plover which, judging by the length of the tarsus, must have belonged to this species. In Japan it is common throughout the country. It is most likely distributed over most of N.E. Siberia in the breeding-season; Middendorff procured it at Udschoj-Ostrog; and further west Mr. Seeböhm met with it on the Yenesei first on the 5th of June, and found it plentiful at Koo-ray'-i-ka as it was passing north. It was "extraordinarily common" at Goleheeka, and was breeding there. Dr. Finckh does not record it from the river Ob, nor does it inhabit, properly speaking, the south-eastern portion of the continent, although it is not improbable that stray birds, wandering westward of their regular habitat, in company with the closely-allied European species, may occasionally turn up in Asia Minor or Palestine. Through these countries individuals led astray in this manner have perhaps passed, or, if not, they have gone westward through Europe along with other Asiatic species from more northerly latitudes; for, singular to say, the species has been obtained in Heligoland by Herr Gätke; and a few years ago Mr. Dresser detected a specimen in Leadenhall Market, which had been sent from Holland with the common Golden Plover.

Habits.—When the Asiatic Golden Plover arrives first in Ceylon it is very tame, and can easily be walked up to and shot; and if perched on a rock in the water it will allow a boat to pass close to it without rising. After a short period it gets wilder, but is never very shy. It is very fond of bare fields, and is usually found in flocks of a dozen to thirty or forty, which extend themselves over a considerable extent of ground, and run hither and thither independently of one another, every now and then making a spasmodic sort of peek at some insect which its large eye catches sight of, and then resuming its bolt-upright position. I have seen vast flocks of it on the ooze in the north-west of Ceylon; but where these were assembled small flocks were likewise to be seen on the grassy land on the shore. As above mentioned, its movements are greatly affected by rain, after which it appears in many localities where at other times it is never seen. During wet weather in November or December a few are often to be found on the Galle face at Colombo, and likewise on the esplanade at Trincomalee, in both of which places they are almost always in company with the Mongolian Sand-Plover, and do not appear to be nearly so shy as when met with on the sea-coast. It is its habit to run slowly when walked up to, and then stand perfectly still, with its body turned away from the observer and head on one side; and in this position it remains till approached within shot of, or nearly so, when it suddenly stretches out its wings, and, after taking one or two quick strides, flies off along the ground with no great speed. When a flock are on the wing, having been disturbed on the sea-shore, with perhaps a number of other shore-birds, they fly very quickly, sometimes rising and falling in their course, and shooting down near the earth with the rapidity of an arrow, as they hurry off to some new feeding-ground at a distance from the intruder. In general they are much more silent than the Golden Plover of Europe; and I am only acquainted with their ordinary note of alarm, which is one of two syllables, like *til-wee*. Mr. Seeböhm, who heard it during the breeding-season in Northern Siberia, says that its voice there exactly resembles that of the Grey Plover, which I have noticed in my last article; and he noticed all three variations, the third, however, being much more frequently uttered by it than by the Grey Plover. In Ceylon I have found the food of this species to be insects of various kinds, worms, and slugs.

In Borneo, where the species is very common in the cool season, Mr. Mottley says they fly "in large flocks, especially frequenting the bare muddy places where buffaloes are in the habit of bathing; they are difficult,"

he writes, "to approach, except in a high wind, when they are very tame; and a large number may be shot at once as they rise. When disturbed they usually perch in some bare, stony spot."

Nidification.—Mr. Seebohm found this Golden Plover breeding on the Yenesei, in lat. $69\frac{1}{2}^{\circ}$, in the early part of July, and took its eggs on the 13th of that month. It nests on the wide-spreading tundras of that region, which are covered chiefly with moss and lichen, "sprinkled with patches of bare pebbly ground, and interspersed with hummocky plains, where ground-fruits and gay flowers were growing." The nest was a "mere hollow in the ground upon a piece of turfy land, overgrown with moss and lichen, and was lined with broken stalks of reindeer moss."

In a series of two clutches of four before me, the only eggs extant of this species, and for an examination of which I am indebted to my friend Mr. Seebohm, one set are light clay-buff and the other very pale buff with an exceedingly faint greenish tinge in them. The former are richly marked with dark sepia, in the form of large straggly-edged blotches collected in a tolerably well-marked ring round the large end, with numerous large blotches extending quite round the small end; one specimen is characterized by not a few streaky marks and short lines, chiefly at the small end. The pale clutch are marked with sepia-black clouds at the large end, and the same very dark blots towards the small end, under which are a few specks of bluish grey. In shape they are pyriform, but not much compressed at the point; the obtuse ends are rather flattened. The first clutch vary in size from 1.89 to 1.91 inch, by from 1.27 to 1.28; the second from 1.89 to 1.92, by from 1.27 to 1.32.

Genus ÆGIALITIS.

Bill as in *Charadrius*, varying in robustness. Wings long, reaching to the end of the tail, with the tertials nearly equal to the primaries. Tail short and cuneate. Legs and feet slender; the tarsus longer in proportion to the toes than in the last; hind toe wanting.

Of small size, but stout form. The change to summer plumage chiefly in the head and neck.

ÆGIALITIS GEOFFROYI.

(THE LARGE SAND-PLOVER.)

Charadrius asiaticus, Horsf. Tr. Linn. Soc. xiii. p. 187 (1821).

Charadrius geoffroyi, Wagl. Syst. Av. fol. 4, p. 13 (1827); Schlegel, Mus. P.-B. *Cursores*, p. 39 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1020 (1873).

Charadrius rufinus, Blyth, Ann. & Mag. Nat. Hist. xii. p. 169 (1843).

Hiaticula geoffroyi, Blyth, Cat. B. Mus. A. S. B. p. 262 (1849).

Ægialites leschenaulti (Less.), Blyth, Ibis, 1867, p. 163.

Ægialitis geoffroyi (Wagl.), Heugl. Syst. Uebers. Vög. N.O.-Afr. p. 56 (1856); Jerdon, B. of Ind. iii. p. 638 (1864); Harting, Ibis, 1870, p. 378; Swinhoe, P. Z. S. 1871, p. 404; Holdsw. P. Z. S. 1872, p. 471; Shelley, B. of Egypt, p. 238 (1872); Walden, Ibis, 1873, p. 316; Legge, Str. Feath. 1873, p. 489; Salvadori, Uccelli di Borneo, p. 318 (1874); Legge, Ibis, 1875, p. 400; Walden, Trans. Zool. Soc. 1875, ix. p. 227; Armstrong, Str. Feath. 1876, p. 339; Hume, *t. c.* p. 463; David & Oust. Ois. de la Chine, p. 426 (1877); Dresser, B. of Eur. pts. 69, 70 (1878); Hume, Str. Feath. 1878 (B. of Tenass.) p. 455; Ball, *ibid.* 1878, vii. p. 226.

Cirrepidesmus geoffroyi (Wagl.), Hume, Str. Feath. 1873, p. 229, et 1874, p. 288, et 1876, p. 12.

Sandpiper, Europeans. *Kotan*, Tamils in Ceylon.

Oliya, *Ola-watuwa*, Sinhalese.

Adult male and female (Ceylon). Length 8·5 to 9·0 inches; wing 5·5 to 5·7, expanse 17·5; tail 2·2; tarsus 1·5; middle toe and claw 1·0; bill to gape 1·1 to 2·5, at front 0·87 to 0·98.

Winter plumage. Iris brown; bill black, yellowish at the base beneath; tibia and feet slate-bluish or plumbeous, paling to yellowish olive or, in some, fleshy grey.

Head and upper surface with the wings greyish brown, darker on the least wing-coverts and on the face in front of and beneath the eye, all the feathers edged greyish white, most broadly on the wing-coverts and upper tail-coverts; the scapulars and tertials with dark shafts; quills blackish brown, the shafts nearly all white, the central portion of the outer webs of the inner primaries and the tips of the greater coverts white; tips of rectrices and the laterals entirely (with the exception of a brown wash on the inner web) white; forehead and a stripe over the eye to a patch behind it, chin, throat, entire under surface, and under wing pure white; a light brown loreal stripe, more or less conspicuous, connects the gape with the brown facial patch.

Adult male, breeding-plumage (Nahr el Kebir, Syria). Wing 5·6 inches; tail 2·4; tarsus 1·4; middle toe and claw 0·9; bill to gape 1·12.

Forehead, chin, and throat as high as the cheeks pure white, sharply defined across the fore neck against the rufous of the chest and the sides of the fore neck, which colour blends on the breast into the white of the underparts; a broad stripe from the bill to the eye, and expanding beneath it over the cheeks and ear-coverts, as also an incomplete band across the forehead, black; head and upper surface sandy brown, tinged on the sides of the crown and on the hind neck with the rufous of the chest; the margins of the scapular feathers and of the tertials are similarly coloured; wing-coverts with pale margins; the lesser coverts darker brown than the greater; primaries dark brown; from the 6th to the 10th white on the outer webs, except near the tips, the 1st shaft wholly white, the remainder brownish at the base and white near the tip; secondaries tipped with white; upper tail-coverts very pale brownish, broadly margined with white; tail darker brown, the feathers tipped with white, and the outer wholly of that colour; under wing-coverts white, and the under surface of the inner webs of the quills mostly white.

This example, shot on the 30th May, is not in perfect plumage; there are traces of a black band connecting the base of the bill with the incomplete band across the forehead, and these, when fully developed, would leave an isolated white spot above the lores. Mr. Hume has obtained it far advanced in breeding-plumage at Kurrachee as early as the 2nd February.

Female (Syria: May 16, 1877). Has the white throat, rufous chest, and hind neck of the male, but wants the black markings of the face and forehead, the lores and face being mingled rufous and brown, and the forehead above the lores white, the centre part in continuation of the culmen being brownish; the region above the eye is tinged with rufous as in the male.

Young. Birds of the year have but little white on the forehead; the entire lores and a band nearly across the chest are brown, and the margins of the upper-surface feathers slightly fulvous; there is also a fulvous patch on the sides of the chest.

Obs. A number of specimens which I have examined from Asia Minor in breeding-plumage correspond in all respects with the above descriptions. There is but little variation on either the bill or wing, and the pale rufous of the chest is much the same in extent and hue in old specimens.

A species somewhat allied to the present is *Æ. placida*, Gray, procured by Jerdon in Burmah, inhabiting China, where it is the *Æ. hartingi* of Swinhoe, and figured as such in the Proc. Zool. Soc. 1870, pl. 12. It has all the quill-shafts brown, and no white patch on the outer webs of the shorter primaries, but the tips are margined outwardly with white; the outer tail-feathers have a white tip and a subterminal brown bar, somewhat similar to the coloration in the Common Dotterel (*Eudromias morinellus*). The measurements, according to Mr. Hume, are—wing 5·7 inches, tarsus 1·35, bill at front 0·82. This species may perhaps occur as a straggler in Ceylon; it has, however, only once been obtained in India.

Distribution.—This fine Sand-Plover, though not so common as the next species, is nevertheless tolerably frequent in Ceylon. Layard may or may not have met with it; for in his catalogue he only enumerates one species of littoral Sand-Plover, which he styles *Hiaticula leschenaulti*, and which, as he informs me, in common with all the birds in his list, was identified by Blyth. This title was applied by Blyth to the present species ('Ibis,' 1867, p. 164), as can be plainly seen by his saying that the *Charadrius asiaticus* of Horsfield and Mr. Tristram was the same as *Ægialitis leschenaulti*, which statement fixes the bird as *Æ. geoffroyi*. In his catalogue, dated 1849, of the birds in the Asiatic Society's museum, however, he used the correct title for the Large Sand-Plover. Against the inference that Layard's birds were really the Large Sand-Plover, we must place the fact that the species which would be thereby excluded from his list is by far the most abundant; and therefore the point must always remain a moot one, as there are no specimens of either species at present in the Poole collection.

I first procured this Plover on the 4th of January, 1873, at the Kumburnputty salt lagoon, in the Trincomalee district; and my attention having been once drawn to it, I found it not uncommon*, frequenting other salt lakes near the sea in twos and threes, or affecting the sea-shore itself, particularly near the mouths of rivers. In the hot season (July) of the same year I met with it in small flocks on the sea-beach near Hambantota, and more particularly saw it in the hollows of the great sand hills near that place; these were immature or non-breeding individuals, or they would not have been in Ceylon at that period. I unfortunately did not shoot any until the last day I was in the district, and then only got one specimen, which was a yearling bird; others may have been in partial summer dress, as I procured specimens of the next species in that stage, though they were evidently barren birds. On the north-west coast I have only seen a few birds of this species. I have no particular note of the dates of its arrival and departure; but they must correspond with other shore-birds. I met with several individuals, evidently new arrivals, on flooded lands south of the Virgcl, as early as the 13th of October.

In India it has chiefly been noticed on the north-west and north-east coasts. Jerdon remarks that he procured it at "Madras and elsewhere, but never far inland;" and Mr. Ball shot it at the mouth of the

* Subsequent to the publication of my paper in 'The Ibis,' 1875.

Chandballi river, north of the Godaveri. At the Laccadives it was not very common, according to Mr. Hume, for he only procured it at two islands—Cardamum and Kiltan. At Calcutta it is only rarely seen in the market; but on the eastern shores of the bay it appears to be more common. Dr. Armstrong says he found it abundant on the sands and mud banks near Elephant Point. It visits the Andamans and Nicobars. Capt. Ramsay got it in South Andaman; and it was observed by Mr. Hume at Port Blair, Macpherson's Straits, Camorta, and Montsehall; it remains until the middle of May, and specimens have been procured in September. Mr. Hume met with it at Kurrachee harbour in thousands, and subsequently writes of its general distribution in the north-west as follows:—"I procured this species in Northern Guzerat, on the borders of the river. It is very common during the cold season along the coasts of Sindh, Cutch, and Kattiawar. But neither in Sindh nor in Jodhpoor do I know of its occurring inland, except at the time of its migration, from the 10th August till the 15th September, or during April and May, when, as in the case of *Squatarola helvetica* (which leaves earlier and returns later), it is met with at large pieces of water inland." Mr. Adam has obtained it in August in breeding-plumage at the Sambhur Lake. It is one of those species which Captain Butler noticed in the harbour at Kurrachee in the hot season. Proceeding beyond the confines of India, we find Severtzoff recording the capture of three specimens only in Turkestan in June, July, and August. One of these, the second, was obtained at Lake Chatir-Kul, at an altitude of 11,000 feet above the sea, and the third on the east coast of the Caspian. It must therefore breed in that country. In Asia Minor it has been procured by Mr. Danford; and in Palestine Canon Tristram found it, in company with the next species and the Common Dotterel, overspreading in flocks the desert between Arabah and Beersheba. Northward it extends to the shores of the Red Sea and the north coast of Egypt. In the peninsula of Sinai both Mr. J. K. Lord and Mr. C. W. Wyatt observed it, the latter gentleman having met with it in large flocks near Tor. Von Heuglin saw it in winter on the north coast of Egypt; and Captain Shelley saw a flock of about thirty on Lake Marcotis in the beginning of February, and near Damietta again observed considerable flocks of a Plover, which he considers was the present species. Von Heuglin met with it all along the coast of the Red Sea and Gulf of Aden, and considers it to be resident there, as he observed it from June until November. Mr. Blanford procured it at Massowa and in Annesley Bay, and at Zanzibar Dr. Kirk obtained it. It extends to Madagascar, where it was found to be common by Messrs. Schlegel and E. Newton. In the Seychelles group the latter gentleman procured it on the island of Mahé: he likewise records it from Mauritius. Its range extends to Cape Colony, where it is rare, according to Layard, who procured but one specimen on the Salt River, near Cape Town. On the south-west coast it is recorded from Benguela by Professor Barboza de Boeage; and this locality is by far its westernmost limit.

Returning to trace out its distribution in Eastern Asia, I do not find it recorded by any traveller from Siberia or Amoor Land, so that we may safely say that it has not a high northern range, although Mr. Whitely procured it in Japan. It must be, however, rare in these islands, for Messrs. Blakiston and Pryer do not record it. It is found on the China coast in winter, according to Swinhoe; moreover Père David states that numbers are to be seen in the Shanghai market in May, as many in breeding-dress as in that of winter. In the island of Formosa Swinhoe found it breeding, obtaining its eggs on the sandy coasts; and it is probable that the young birds there are those which migrate as far south as the north coasts of Australia. It is said to have been found in the Philippines, and by Godeffroy in the Pelew Islands. It is spread throughout the Malay archipelago, being found on some of its islands in the breeding-season; for in Celebes Meyer observed it on the Lake of Tondano in the month of June, and on that of Limbotto in July. It has been obtained in many places in Borneo by Diard, Schwaner, Mottley, and others; and in Sumatra (Lamong, &c.) and Java it has also been procured, having been first described by Horsfield from the latter island. Other islands on which it has been noticed are Flores, Timor, Gilolo, and Morotai. In New Guinea it was obtained by Herr Müller; and on the opposite coast of North Australia it is recorded from several localities, viz. Cape York (whence Mr. Harting has skins), Port Darwin, Port Essington, and the Gulf of Carpentaria, while from Rockingham Bay Mr. Ramsay likewise notes it.

Habits.—This Sand-Plover, as its name implies, is an inhabitant of the sea-shore, frequenting alike the sands on the open coast and the ooze and muddy foreshores of tidal lagoons, creeks, backwaters, and salt lakes in the vicinity of the sea. It does not, so far as I have observed, associate with any other species but the

next to be considered (the Lesser Sand-Plover) ; and I have, on one or two occasions, found it alone, both in small flocks and in scattered company consisting of two or three individuals. Under the first-named condition it was frequenting the secluded hollows on the summit of the great sand hill at Hambantota, and seemed to be resting when I met with it (about 10 A.M.) after the business of feeding in the morning. It is shier than its smaller relative, and all I procured were killed with long shots, as I always found it difficult to approach. On one occasion it was observed and procured on an inland situation, namely on some flooded meadows a few miles from the sea on the south bank of the Virgel ; a few were seen here frequenting little grassy eminences which were surrounded by the water covering the land for a wide extent. In India it has been usually found on the sea-coast ; and on the shores of Burmah Dr. Armstrong found it in company with immense flocks of "smaller Sand-Plovers," the species referred to being no doubt *Æ. mongolica*. On passage to more northerly latitudes, particularly in the north-west of India, it occurs, in common with other purely littoral species, far inland.

As regards its food, I have found the contents of its stomach to consist of small insects and larvæ, mixed with gravel ; and Layard detected in it minute crustaceans and worms. Von Heuglin found it frequenting sand banks, coral reefs, and low-lying shores, sometimes in flocks and sometimes alone, whilst on other occasions it was associated with other shore-birds.

Nidification.—But little is known up to the present time concerning the breeding-habits of this Plover. It is probable that one great cradle of the species is in Western Asia and on the Red-Sea coasts. More specimens have been obtained in this region in summer plumage than anywhere else, except, perhaps, the China coasts, including Formosa. In the latter island Swinhoe found it breeding, and a series of its eggs, which I have had the advantage of examining, were procured by him. They are pointed ovals, rather stumpy at the small end, and with a large diameter for their length. They are clay-buff, with streaky blots throughout of inky black, mixed with some large blotches and numerous "pencilings" or irregular streaks of the same, under which there are blotches of purplish grey and bluish grey. They vary from 1.27 to 1.37 inch in length, and from 1.0 to 1.05 in breadth.

Together with these eggs, some others were collected by Swinhoe in the same locality, and identified by him as those of the Asiatic Golden Plover, which bird he says is common all the year round, breeding in great abundance on the south-west marshy plains. As I have above remarked in the preceding article, this is probably an error ; and I think that the eggs all belong to the present species. The whole were probably brought to him by native collectors, and the smaller types, which I have just described, identified by him as those of *Æ. geoffroyi*, while the larger were taken for *Charadrius fulvus*. They are altogether too small, and look like dark heavily-blotched specimens of the eggs of the former species. There are 9 eggs altogether—rich stone-buff, very handsomely blotched throughout with sepia-black clouds and blots, mixed up with straggly markings of the same over spots of light brown and bluish grey. They are of the same shape as the eggs marked *Ægialitis geoffroyi*, measure 1.38 to 1.46 inch by 0.96 to 1.06, and are clearly not Golden Plover's eggs.

ÆGIALITIS MONGOLICA*.

(THE MONGOLIAN SAND-PLOVER.)

Charadrius mongolus, Pallas, Reise, iii. p. 700 (1776).

Charadrius mongolicus, Pallas, Zoogr. Rosso-As. ii. p. 136 (1811); Middendorff, Sibir. Reise, ii. p. 211, pl. 19. figs. 2, 3 (1853); Schrenck, Reis. im Amur-L. p. 411 (1860); Schlegel, Mus. P.-B. *Cursores*, p. 41 (1865); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1023 (1873).

Charadrius cantianus, Lath. *apud* Horsf. Trans. Linn. Soc. xiii. p. 187 (1821).

Charadrius rufinellus, Blyth, Ann. & Mag. Nat. Hist. xii. p. 169 (1843).

Hiaticula inornata, Gould, B. of Austr. vi. pl. 19 (1848).

? *Hiaticula leschenaulti*, Less. *apud* Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.

Ægialitis pyrrhothorax, Temm. *apud* Jerdon, B. of Ind. iii. p. 639 (1864).

Ægialitis mongolicus, Pallas, Harting, Ibis, 1870, p. 384; Legge, Ibis, 1874, pp. 27, 28, 29;

Salvadori, Uccelli di Borneo, p. 310 (1874); Hume, Str. Feath. 1876, pp. 293, 463;

Armstrong, *t. c.* p. 339; David & Oust. Ois. de la Chine, p. 427 (1877).

Ægialitis mongola (Pallas), Walden, Ibis, 1873, p. 317; Hume, Str. Feath. 1878 (B. of Tenass.), p. 455, et 1879, viii. p. 112 (List Ind. B.); Ball, *ibid.* 1878, vii. p. 227.

Cirrepidesmus mongolicus (Pallas), Hume, Str. Feath. 1873, p. 230, et 1874, p. 287, et 1875, p. 12; *id.* Nests and Eggs, iii. p. 571 (1875).

Ægialitis mongolica (Pall.), Walden, Trans. Zool. Soc. 1875, ix. p. 227; Legge, Ibis, 1875, p. 401.

Pallas's Shore-Plover and *The Lesser Sand-Plover*, Jerdon et auctorum; *Tschitsche hirugu*, Amoor Land (Middendorff). *Kotan*, Ceylonese Tamils; *Watuwa*, Ceylonese.

Adult male and female (Ceylon). Length 7.1 to 7.5 inches (average about 7.3); wing 4.75 to 5.0; tail 1.9 to 2.0; tarsus 1.2 to 1.3; middle toe and claw 0.85 to 0.9; bill to gape 0.7 to 0.8, at front 0.68 to 0.72. Iris deep brown; bill black, slightly pale at the base beneath; tibia and feet plumbeous, with the tarsi slate-grey, the edges of the scales being darker, or in some greenish plumbeous entirely.

Winter plumage (Ceylon). This species almost entirely resembles the last; but, as it is much more common, I will give a description of it in detail for the benefit of local students and collectors:—

Above greyish brown, paling on the hind neck, and with the margins of the feathers paler than the rest; forehead white, passing above the lores and over the eyes, behind which the supercilium widens and is joined by a white streak from beneath the eye; wing-coverts edged with whitish; edge of the wing and tips of greater coverts white; tips of the secondaries, as also the outer edges, and a portion of the web near the shaft of the innermost, white; tertials more or less finely edged with white; primaries and shafts as in the last; feathers of the rump and upper tail-coverts not quite so broadly edged as in the last; tail the same, but slightly less graduated; lores brown, darkest at the eyelid; cheeks and ear-coverts brownish; beneath white, the brown of the sides of the neck encroaching on the chest in some more than in others; under wing and axillaries as in the last, pure white. The amount of white varies on the forehead, consequent on age.

Adult male, breeding-plumage (Swatow, 24th May). Throat, upper part of fore neck, and a broad frontal band, together with the under surface, white; a jet-black band from the bill to the eye, and expanding beneath it to the ear-coverts, and another narrow connecting one across the forehead; a broad rufous band, of a darker hue than in

* I adopt the spelling as altered by the author of the species himself in 1811, as it is more correct than his original name *mongola*.

the last species, across the chest, extending over the sides of the neck and almost across the hind neck; above and behind the eye there is a white patch joining the rufous; the crown tinged with fulvous next the black band; above darker brown than *Æ. geoffroyi*, and not tinged with rufous; the inner primaries with less white, but the secondaries and greater coverts tipped with white in the same way; outer tail-feathers brown on the inner web. This example measures:—wing 5·3 inches; tail 2·1; tarsus 1·15; bill to gape 0·8.

Some examples have the rufous more intense than others. The example No. 1738 in the Swinhoe collection, referred to by Mr. Seebohm (Ibis, 1879, p. 25), is an instance of such, the front of the crown being almost as richly coloured as the chest.

Occasionally the forehead is black down to the bill, the white frontal band being entirely wanting. Mr. Harting instances a specimen from Calcutta, and others from India, as well as from New Guinea, in this plumage, and Schrenck describes one from the Amoor. In others the black is bordered by white feathers, and in the specimen which formed the type of the supposed species *Æ. pyrrhothorax*, founded on this character, all but the tips of the frontal feathers are white.

Specimens are to be met with, as mentioned below, in the hot season, which appear to be in a partial summer dress, with traces of a rufous band extending completely across the chest, but with the forehead brown, as in young birds; these examples are, in all probability, in the second year, and, notwithstanding that they are barren birds, have made an advance towards the nuptial livery.

Young, in first autumn. Upper surface slightly darker than the adult in winter plumage, with the feathers margined (most conspicuously as regards the scapulars, tertials, and wing-coverts) with buff and buff-grey; forehead in some quite brown, in others buff at the base of the bill; a blackish-brown spot round the anterior corner of the eye; the sides of the chest fulvous, brighter in some than in others, and sometimes with this colour almost crossing the chest; the upper breast sometimes shaded with buff; innermost secondaries with less white on the outer webs; the spot on the outer tail-feathers smaller than in the old bird.

Obs. This species being migratory through India to Ceylon, Indian examples call for no comparison with ours. Measurements are given as follows:—(Furreedpore) length 8·42 inches, wing 4·73, tarsus 1·25, bill at front 0·75 (*Cripps*); (Irrawaddy delta, 5 males and 5 females) length 7·0 to 8·2, wing 4·8 to 5·15, tarsus 1·3 to 1·4, bill from gape 0·85 to 1·0 (*Armstrong*)—the maximum length of bill in this case is exceptional; (Sindh) length 7·25 to 8·0, wing 4·8 to 5·0, tarsus 1·27 to 1·39, bill at front 0·66 to 0·71 (*Hume*).

Distribution.—The Lesser or Mongolian Sand-Plover is very abundant in Ceylon, frequenting the north, north-west, and north-east coasts, the eastern side of the island, and the south-eastern sea-board, as well as occurring not unfrequently in the Galle district. I have also met with it on the islands in the Negombo lake; and on the Galle face (Colombo) during the north-east monsoon it is quite a common bird. I have observed it on the sands near Mt. Lavinia, and it may therefore be safely said to inhabit the entire sea-board of Ceylon. It is noteworthy that it is more often seen, and perhaps in greater numbers, on the public resort at Colombo, above-mentioned, than in any other locality in the Western Province. It is equally fond of the csplanades at Trincomalie and Jaffna, and, in fact, any bare land near the sea-shore or bordering the salt lakes is sure to be tenanted by it. It is, however, found on the edges of all the salt lagoons and at the mouths of rivers on the north and east coasts, as well as on grassy lands. In the month of October I have met it in large numbers on flooded meadows some distance inland on the south bank of the Virgel. In the Hambantota district it was to be found in 1873 frequenting the dry shores of the leways plentifully during the hot season. Most individuals were in pure winter plumage, but a few showed traces of the rufescent breast. It arrives in the island in numbers in September and October; but not a few may be seen on the north coast some weeks previous to that time. It departs at the end of April and during May; but I have no doubt that many immature birds remain in the island throughout the year.

In regard to India, Jerdon met with it, he says, in the Carnatic, on the Malabar coast, and elsewhere, but seldom far inland; he observes that it is bought in great numbers to the Calcutta market; and Mr. Hume remarks that a few are daily to be seen there during the season. He records it from the Laeca-dives, where he saw it at Cardamum. Mr. Ball met with it in Singhbhum and on the coast of Orissa, at the mouth of the Chandballi river. In Furreedpore Mr. Cripps only once saw it on a chur of the Muddoomutee river. How far it extends up the Ganges I am unable to say, but probably during the season of migration only will it be found inland. In June it has been procured at Allahabad. On the opposite side of

the peninsula it is common on the sea-board. Major Hayes-Lloyd saw it in large flocks in Kattiawar; and Mr. Hume procured it on the borders of the Runn in Northern Guzerat, and states that it is very common on the coasts of Sindh, Cutch, and Kattiawar, but not found inland except during the time of migration, *i. e.* in April, May, August, and September. He observed it in vast numbers in Kurrachee harbour and on the Mekran coast; and in the former locality Capt. Butler has seen it in the hot weather. Turning eastward we find Dr. Armstrong recording it as extremely abundant, occurring in immense numbers on the sand and mud flats between Elephant Point and China-Bakeer, and on the mouth of the Rangoo river. Capt. Beavan procured it on the Salween, near Moulmein; and Mr. Oates says it is tolerably common in Pegu. To the province of Tenasserim it is a common cold-weather visitant, occurring on the coast and the shores of estuaries. It was procured at the extreme south on the Pakchan river. In the Andamans and Nicobars it is very abundant, and the commonest species on those coasts next to the Sandpiper (*Tringoides hypoleucus*). It is found there in July, August, and September in partial summer dress; and I have no doubt the examples procured by Mr. Davison in this plumage were immature birds showing a mixture of nuptial and youthful livery. Mr. Hume records it from Singapore; but I do not find it spoken of as inhabiting Sumatra, where its ally, the last species, has been recently obtained. In Java it is said to be the *Æ. cantiana* of Horsfield, as Blyth examined in Calcutta what was supposed to be the type specimen from that island; in addition to which Horsfield gives neither measurements nor description of the species. In Borneo it has been obtained at Pontianak, in Sarawak, and in the south of the island. In Ceram it has been obtained by Hoedt, in Morotai by Bernstein, in Aru by Wallace, and in New Guinea it is the reverse of rare. To the south it has been found in the island of Oomago in Torres Straits, and at Port Essington Mr. Gilbert obtained it. In his recent list of Australian birds, Mr. Ramsay notes it from Cape York and Rockingham Bay, in lat. 22° S., which is its southernmost limit. Turning north, again, we find Cuming procuring it in the Philippines, and Swinhoe obtaining it in North-east and North-west Hainan in March. He never met with it on the south coast of China, but saw it in abundance in Shanghai, where also Père David met with it in May. It has been obtained in the Corea, and also on the shores of the sea of Okhotsk, where Middendorff met with flocks of females in pairs in July. In Japan it has been procured in Hakodadi and South Yesso. In this quarter of the globe it has been met with as far north as the Choris Peninsula, in Behring's Straits. Pallas first found it on the confines of Mongolia near salt lakes between the rivers Onon and Argun; and Radde observed it in the same region at Tarei-nor in May. Schrenk procured it on the Amoor. It evidently breeds in all this region; and its summer-quarters do not seem to extend to the westward in these latitudes, for Seebohm did not see it on the Yenisey. Prjevalsky does not record it from Koko-nor, through which it must needs pass on its migration from Thibet to Mongolia. Stoliczka procured it at Kiangsira in Thibet; but Dr. Scully did not meet with it in Kashghar. It was, however, seen on the Chimouraree Lake in Ladakh by Dr. Adams, and was breeding there at the time, the young being hatched and the season too far advanced to obtain eggs.

It breeds, according to Severtzoff, in the south-eastern portion of Turkestan, and occurs on passage in the north-western part, but was not seen above an altitude of 1000 feet. Mr. Blanford obtained it in the islands of the Persian Gulf, and observes that it has not been met with on the Caspian. In Palestine Canon Tristram found it on the Kishon. It extends to the coasts of the Red Sea, and as far south as the Gulf of Aden, where Von Heuglin procured it in winter plumage on the Somanli coast: Blyth also received it from Aden. It has on one occasion only appeared in Europe, when it was captured near St. Petersburg.

Habits.—This Sand-Plover associates in large flocks, as well as in small companies, which disperse themselves over a good deal of space on the muddy flats and tidal sands bordering the numerous lagoons, lakes, and backwaters of the northern and eastern shores of Ceylon. In its company may be found a few Kentish Plovers and also the little Ringed Plover, while occasionally the last species, *Æ. geoffroyi*, may be seen with it. It is not by any means shy; and when frequenting bare grassy places like the Galle face, where it appears, after rain, with the Golden Plover, its behaviour is rather stupid, standing bolt upright and allowing itself to be approached to within a short distance before taking flight. Small flocks of a dozen or more are frequently to be seen on these public resorts after a heavy night's rain—remaining there for several days, in spite of the hundreds of carriages, pedestrians, and bullock-waggons which are continually

passing them. They run about and feed apart, covering about a quarter of an acre perhaps, and when disturbed all get up together and fly leisurely further on. In September they commence to appear at Colombo, and are common in November and December, and may then be shot quite stained, like the Pipits, with the cabook-dust of the Galle face. The majority of those which arrive first are young birds; and more females are obtained than the other sex. When they first come to the island they are tamer than they are in the middle of the season, or in the spring before migrating, when they become somewhat shy and restless. The short bill of this species, as well as its smaller size, always serve to distinguish it, at a distance even, from its congener *Æ. geoffroyi*. Its note is a sharp plaintive whistle; and I have heard a trilling sound uttered by two birds associating together. Its food consists of sand-flies, small worms, minute crustaceans, and insects, the latter of which it entirely feeds on in grassy places, which, I think, are frequented more by it than by any other Sand-Plover in Ceylon. Both this and the last species are, comparatively speaking, inactive birds, for they do not run hither and thither, taking stretches of 10 or 15 yards, with an almost invisible movement of the legs, as one sees in the case of the Kentish and Ringed Plovers; but, on the contrary, they move rather slowly and take short runs. When winged, however, and chased they run with great speed; and Middendorff says that they swim and dive well when wounded.

Nidification.—As mentioned above, Dr. Adams found this species breeding in Ladakh, the mountainous portion of Thibet bounding Cashmir on the east. Here he found the young at the Chimouraree Lake, but he was too late to obtain eggs. Mr. Hume says that it breeds in May and June about this and other Thibetan lakes.

ÆGIALITIS CANTIANA.

(THE KENTISH PLOVER.)

Charadrius cantianus, Lath. Ind. Orn. Suppl. p. 66 (1801); Gould, B. of Eur. iv. pl. 298 (1837); Jerdon, Madr. Journ. 1840, xii. p. 203; Layard, B. of S. Afr. p. 296 (1867); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1055 (1873).

Ægialites cantianus (Lath.), Bp. Comp. List, p. 45 (1858); Swinhoe, P. Z. S. 1871, p. 404; Holdsw. ibid. 1872, p. 471; Legge, ibid. 1875, p. 374; Butler, Str. Feath. 1877, p. 290.

Hiaticula cantiana (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 263 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.

Ægialitis cantianus (Lath.), Jerdon, B. of Ind. iii. p. 640 (1864); Shelley, B. of Egypt, p. 240 (1872); Legge, Str. Feath. 1875, p. 372; Armstrong, ibid. 1876, p. 340; Hume, t. c. p. 464.

Ægialitis cantiana (Lath.), Legge, Ibis, 1875, p. 401; Irby, B. of Gibraltar, p. 162 (1875); Dresser, B. of Eur. pt. 49 (1876); Hume, Str. Feath. 1879, viii. p. 112 (List Ind. B.).

Ægialophilus cantianus (Lath.), Hume, Str. Feath. 1873, p. 230; id. Nests and Eggs, iii. p. 571 (1875); Scully, Str. Feath. 1876, p. 185.

Kentish Dotterel of some; *See-Regenpfeifer*, German; *Charran*, Spanish. *Chulloke*, *Sai Yamghurchi*, Turki (Scully); *Shiro-chidori*, Japanese; *Kotan*, Ceylonese Tamils. *Watuwa*, Sinhalese.

Adult male (Ceylon). Length 6.1 to 6.3 inches; wing 4.1 to 4.2; tail 1.5 to 1.7; tarsus 1.0 to 1.1; middle toe and claw 0.65 to 0.7; bill to gape 0.6 to 0.68.

Iris dark brown; bill black; tibia and feet dusky plumbeous; the tarsus paler or bluish, in some greenish.

Breeding-plumage (Kanthelai, August). Head, back, and wing-coverts ashy brown, darkening into blackish brown on the upper tail-coverts and four central rectrices, and edged pale throughout; forehead, a broad supereiliary band, cheeks, throat, and entire under surface white, passing in a narrow collar round the hind neck; a broad frontal band, lores, ear-coverts, and a patch on each side of the chest black, the ear-coverts paler than the rest; a pale rufous border above the black frontal band and round the upper edge of the supercilium and collar; quills blackish brown, paler on the inner webs, and with the shafts white, the first being purer than the rest, the outer webs of the innermost primaries with a white edge; the secondaries tipped white, and with the base of the inner webs the same; the three outer pairs of rectrices white, with a brownish wash on the inner web of the third.

Adult female in summer (shot with young, Hambantota, July). Wants the black frontal band, black stripe beneath the eye, and patch at the sides of the neck; lores, forehead, and supercilium white, as in the male, a brown stripe instead of a black one through the lores; feathers anterior to the eye, bordering the white fringe, blackish; a narrow whitish band across the hind neck edged obscurely with buff; the patch on the sides of the chest brown, like the back. This individual has the feathers of the head tipped with white, which appears to be caused by abrasion and bleaching from the effects of a burning sun on the arid salt-pans on which I shot it.

Another example, shot from the nest at Trincomalie, is identical in all respects save the white tippings of the head-feathers, the crown being plain brown, like the back, the feathers only finely edged pale. Specimens shot at this time are all in the abraded plumage, which is moulted in August.

In a series of females the length varies from 5.9 to 6.2 inches, and the wing from 3.7 to 4.1.

Male in winter. Differs from the male in summer in wanting the rufous colouring on the head, and in the black band on the head being almost obsolete; the lores and the stripe behind the eye are brownish, and so are the patches at the sides of the chest; the white collar is of the same width as in summer, and edged above with rufous.

Young. The nestling, when able to follow the parent bird, is fulvous above, with black lines and spottings on the crown and nape, and a velvety-black streak down the centre of the back; on either side of this streak the back is marked with blackish; down of the tail black; beneath the body is white; legs and feet sickly olive-green.

The immature plumage of the first year is quickly acquired, and resembles that of the adult female; the forehead is white, and the supercilium *whitish*; the nuchal collar is very broad, but interrupted sometimes in the centre. Males and females are alike.

Obs. An examination of a large series of Kentish Plovers from various parts of the world will show that it is a very variable species as regards size; and the Ceylon form, particularly as regards females, is, perhaps, the smallest of all, consisting as it does of tropical-bred birds, which must needs be, owing to climatic influence, a stunted race. It is likewise a variable bird as regards plumage, some examples being much more highly tinted with rufous on the head and across the neck than others; and I think our race will be found to be almost less richly coloured than any other. A male in breeding-plumage, procured by myself in the island of St. Vincent (May), has the rufous bordering very bright and spreading entirely over the crown; the black frontal band, loreal stripe, and chest-patches are intense black: wing 3.95 inches, bill at front 0.68, tarsus 1.1. A Sussex male has the wing 4.2, tarsus 1.1; it has the frontal black band 0.4 inch wide, the white collar bordered by bright rufous, but the head scarcely tinted with it. One from Constantinople (April 26th) measures—wing 4.0, tarsus 1.0, and has the rufous very bright above the eye-stripe and hind-neck collar. A female, measuring in the wing 4.3 inches, has a complete narrow bar across the hind neck tinged with rufous above. Some variation exists in the colouring of the legs. My St.-Vincent example has the tarsus light plumbeous, with the joints and toes blackish, like Ceylon birds. Dr. Scully cites the legs in a Yarkand example as being *greyish black*; and Dr. Armstrong speaks of those of Irrawaddy specimens as being plumbeous grey. His dimensions of a series are:—length 6.5 to 7.0 inches; wing 4.2 to 4.5; tail 1.8 to 2.2; tarsus 1.1 to 1.25; bill from gape 0.75 to 0.95.

Swinhoe's species, *Æ. dealbata*, from China, which Mr. Harting identifies with *Æ. peronii* of Temm., is closely allied to the present, but has the upper surface more "sandy;" and two or three specimens before me want the stripe through the lores; the legs are fleshy yellow. The wing measures 4.4 to 4.7 inches.

Æ. nivosa, from America, the representative of *Æ. cantiana*, has no stripe through the lores, which are *constantly* white. It comes close to *Æ. peronii*, but has a smaller bill.

Æ. ruficapilla, the Australian ally of the present, differs in having no white ring round the neck, and wants the black patch on the sides of the chest; a rufous stripe extends across the forehead and over the eye to the nape. Wing 4.1.

Distribution.—This well-known little Plover frequents the dry districts of Ceylon. It is very common from the Wellaway river eastward all along the sea-board to Batticaloa, and thence northward is found in suitable localities, which between that town and Trineomalie are not so numerous as farther south. Beyond Trineomalie again it is to be found on the borders of, and open land surrounding, the backwaters and salt lakes. In the Jaffna peninsula and on the sands of the Lake it is common; and down the west coast to Manaar I found it equally plentiful. Mr. Holdsworth procured it at Aripu; and south of this it is to be found down the coast to Chilaw. Between that place and Colombo it is less numerous, and only found, according to my observation, in the cool season. In the month of February I have seen it on the islands at the mouth of the Negombo Lake. South of Colombo I never noticed it; but it may occur as a straggler in the north-east monsoon. In the breeding-season it is to be met with inland at large tanks, such as Minery and Kanthelai, where I have found it tolerably abundant and nesting on the shores of these sheets of water: I have not met with it at the smaller tanks; but I have no doubt it occurs at Anaradhapura and elsewhere at the borders of restored lakes.

It is probable that though stationary for the most part in the island there is an influx of migratory birds from the mainland in October, and a diminution again in their numbers in the spring, when some may depart for the north of India.

Leaving the confines of Ceylon, we find Mr. Hume meeting with it at Cardamum in the Laccadives; and, as regards the mainland, Jerdon observes that it is more generally diffused in India than the last two species, being found far inland on the banks of rivers and large tanks, as well as at the mouths of rivers on the sea-coast, which latter localities it prefers. I do not find it recorded from the Deccan or from Chota Nagpur, although Mr. Hume has received it from the Raipur district. At the mouth of the Chandballi river Mr. Ball met with it; but he does not record it from the interior of Orissa. About Calcutta it is not uncommon in the cool season; but to the north-east of this locality Mr. Cripps did not meet with it. In the Irrawaddy

delta it is said to be as abundant as the last species, feeding and intermingling with it. Capt. Ramsay procured it at Tonghoo, and Mr. Davison at Theinzeik, Thatone, Amherst, and Mergui. Mr. Hume observes that it is sparingly distributed about the coasts, creeks, and rivers of the province in the cold season, but has not been observed far inland except at Tonghoo, nor in the extreme south. It is absent from the Andaman and Nicobar Islands, and has not been met with in the Malay peninsula. In the archipelago it has not as yet been observed, although we find Horsfield including in his catalogue of Javan birds a Plover which he calls this species; but Blyth, who examined the bird, is said to have identified it with the Mongolian Sand-Plover; and until it is found on the Malay islands, Ceylon will remain its most southerly limit. Following up the east coast of the continent before returning to North-west India, we find it recorded as common in winter on the coast of China; and Père David remarks that he found it breeding in large numbers on the Hoang-ho. It has recently been obtained by Mr. Everett in Mindanao (Philippines), and has also occurred in the Pelew Islands. In Japan it is common; but on the mainland in Eastern Siberia it is rare. Schrenk did not meet with it in Amoor Land, nor Middendorff in North-east Siberia, which is evidently beyond the northern limits of its range. Prjevalsky, however, met with it throughout Mongolia and about Koko-nor in flocks of three to seven individuals on the shores of salt lakes, where he considers it probable that it breeds. In spring it appears in South-east Mongolia, and about Koko-nor at the end of March. Pallas found it frequenting the salt lakes in Dauria; and Radde procured it in Tarei-nor. In Eastern Turkestan it is, says Dr. Scully, a seasonal visitant to the plains, arriving about the end of March and disappearing in winter; and it was found breeding by him at Sughuchak. Severtzoff also states that it breeds in North-west Turkestan up to an altitude of 4000 feet. It is found on the Mekran coast; and Capt. Butler met with it breeding on the island of Astolah, in the Gulf of Oman. In Kurrachee harbour it is common in the cold season; and Mr. Hume remarks that he met with it at that time all along the banks of the large rivers both in the Punjab and Sindh, and occasionally in some of the inland waters of the latter. He likewise procured it in many places in Northern Guzerat, Kattiawar, and Jodhpoor, where it is common on the coast and inland on the banks of rivers and lakes. At the Sambhur Lake Mr. Adam met with it in large flocks both during the rains and in the cold weather.

It extends through Persia, Palestine, and Asia Minor to Europe, and in the Holy Land was found to be common by Canon Tristram. He met with it near the Kishon, and remarks that it breeds in several places in Palestine. In Turkey it is not uncommon; Messrs. Elwes and Buckley found it breeding on the Bulgarian coast. In Greece, Lindermeyer and Von der Mühle met with it. It is not common in Transylvania, but has nevertheless been found breeding in the country. In Sardinia it is resident throughout the year, in Malta a straggler, and in Italy common but local. It extends through Central Europe, being rare in Southern Germany, to Denmark and Sweden, in the south of which latter country it breeds, though it does not seem to visit Norway. It has not yet been recorded from Iceland and the Faroes, and probably never occurs in these islands. In England it is found only in the south-east, breeding in no other counties but Sussex and Kent. In France it is common on the west coast, and in the Channel Islands it is likewise plentiful. It is not uncommon in Spain, where Mr. Saunders found it breeding on the plains in the south; and near Gibraltar it is very abundant, being found there throughout the year, but most plentifully during the season of migration. In Tangier, Favier states that it is resident and found at the mouths of the rivers; but at the same time many are migratory, arriving in September and leaving again in spring. Mr. Drake likewise records it from Morocco; in Algeria it is common, extending southward into the Sahara, where Canon Tristram found it universally distributed, breeding on the salt lakes there. In Egypt it is plentiful in winter, especially near Cairo; and to Nubia it likewise extends. Von Heuglin observed it on the Nile, but more frequently on the shores of the Red Sea, where it is found in summer, no doubt breeding there, and extending in September and October to the Gulf of Aden. It ranges down the east coast to Mozambique, where it has been found, and thence to Cape Colony, where one specimen is recorded by Layard as having been procured at Knysna. As it has not been recorded from the west coast, I imagine that any stragglers which find their way to South Africa wander thither by way of the east coast, and that this species does not extend down the western side much further than the latitude of the Cape Verds, in one island of which group (St. Vincent) it is resident, as I have myself shot it there in May while breeding. It has also been obtained in the Canary Islands; and in the Azores Mr. Godman found it plentiful in Fayal and Terceira, where it breeds; he likewise met with it in St. Michael's.

Habits.—This interesting little Plover frequents bare land, sandy wastes, dried-up marshes, stony, pebbly reaches along the shores of lakes, lagoons, and salt-pans, and, in fact, any inviting spot which is not very damp in the vicinity of water. It is the exception to find it on muddy foreshores, tidal flats, or ooze; and in the north of Ceylon, where these localities are crowded with Sandpipers, Stints, and the two preceding species, the present bird was observed generally running along the dry edge of the foreshore which had been untouched by the tide, or picking up insects on the burnt-up grass-land still further away from the water. It is fond of wide stretches of sand, such as the vast flats at the head of the Jaffna lake, on which I have seen solitary pairs tripping along almost miles from any other bird. It is at times, as Messrs. Brooke and Shelley observe in their respective writings, difficult to see when standing motionless on parched-up wastes, as the colour of its plumage exactly resembles the soil on which it is reposing. It is very active, running with a very quick movement of its little feet whenever it moves, and when approached runs for 40 or 50 yards without stopping. If startled then, it rises, uttering its double note *chit-ek*, which is not generally repeated until a little interval has elapsed; it is sometimes uttered while the bird is running. I have found it much wilder in some localities than in others; but on the whole it is a tame bird. It is rarely met with in greater numbers than half a dozen, and such a little troop do not associate in very close company, but generally spread over a considerable extent of ground, each member searching for its food quite independently of its neighbours. It is oftener seen singly or in pairs than in little flocks. Its flight, like that of other Sand-Plovers, is regular, and performed with quick though somewhat measured strokes; and before alighting it stretches out its legs and skims along with extended wings. It feeds much on sand-flies, sand-worms, and captures small flies and insects when searching on grass-land for food; I have also found very minute shells in its stomach.

Nidification.—This bird breeds in the south-eastern and northern parts of Ceylon. I procured both eggs and nestlings in down at Hambantota at the end of June and first week in July. It nests on the dry foreshores of the salt lagoons or leways in this district. Near Trincomalee I have found its eggs in a dried-up field near the borders of a salt lake, and at Kanthelai tank on shingly banks and strips of pebbly sand close to the water's edge, both at the beginning and end of July. The nest is generally placed in a depression in the ground, often in the footprints of cattle; but it seems sometimes to be partially formed by the bird. The lining consists of tiny pebbles or pieces of shell; but if the nest is made in coarse sand or fine shingle there is scarcely any foreign matter introduced into it, and the eggs repose in the natural hollow only. The points are sometimes buried in the hollow of the nest, the eggs thus assuming quite a vertical position. The parent bird generally leaves her eggs quietly, while the searcher is still at a distance from her position, and runs some distance from the nest before flying; but I have known one sit until I approached to within thirty or forty yards of her. The eggs are pointed at the small end, but not pyriform; they vary in size considerably, two specimens from the same locality (Kanthelai), as exemplifying the extremes, measuring 1.23 by 0.91 inch and 1.1 by 0.84. The ground-colour is either yellowish stone-colour or olivaceous stone, between which shades there are several tints noticeable. The markings are linear in character, and though they vary in extent and form there is the same tendency to run into hieroglyphic-like streaks and pencillings in all. Some are entirely marked with these blackish zigzag and highly erratic streaks throughout the surface, while others have this colouring intermingled with spots and small blotches of the same; and all eggs have primary or underlying spots and markings of bluish grey. Some specimens are olive-grey, covered nearly uniformly with small irregular blots of dark sepia over indistinct spots of bluish grey, with here and there streaks, strokes, and pencillings of a deeper hue; in others of the same ground-colour the markings are most numerous at the obtuse end, and the egg covered with longer streaks and scratches. Three is the maximum number of eggs, and in many nests I only found two. A pair of abnormally coloured eggs in my collection, taken at Kanthelai, are of a dull olive-stone, with here and there a few distantly-situated clouds of inky black, with smaller spots of the same over numerous lighter inky-grey spots; they measure 1.17 by 0.85 inch and 1.16 by 0.86. A series of European eggs examined by me do not differ generally from those I have from Ceylon; the smallest specimen in a large series measures 1.1 by 0.85 inch.

I append the following extract on the habits of the parent birds while breeding, from my notes in the P. Z. S. 1875, p. 375:—"The various devices resorted to by the old birds to attract attention and draw away

the intruder from the nests were most interesting to witness. They consisted in the bird flying off to the right hand in front and then circling away across me to the left and making a circuit in rear until it came round to where it rose ; this movement it would perform uttering the ordinary note, *chit-ek, chit-ek*. On alighting it would run off, supplementing this sound with a short whistle ; and if successful in inducing me to follow it, it would squat on the ground for a moment and continue on again with a low harsh cry. Were, however, its powers of persuasion not sufficient to draw me away in pursuit of it, it would rise and make the same circuit as before, always alighting to my right hand about 30 yards from where I stood. These movements were performed while I was in actual search of the nest ; when approaching the vicinity of a nest for the first time, however, my attention was always drawn to the bird running along with its wings trailing on the ground."

ÆGIALITIS CURONICA.

(THE LESSER RINGED PLOVER.)

- ? *Charadrius dubius*, Scop. Del. Flor. et Faun. Insubr. p. 93 (1786, *ex* Sonnerat).
Charadrius, sp. nov., Beseke, Schr. Berl. naturf. Gesell. vii. p. 463 (1787).
Charadrius curonicus, Gm. Syst. Nat. i. p. 692 (1788).
Charadrins philippensis, Lath. Ind. Orn. ii. p. 245 (1790).
Charadrius minutus, Pallas, Zoogr. Rosso-As. ii. p. 145 (1811), juv.
Charadrius pusillus, Horsf. Trans. Linn. Soc. xiii. p. 187 (1821).
Hiaticula philippina (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 263 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.
Ægialitis philippina, Scop. *apud* Jerdon, B. of Ind. iii. p. 640 (1864).
Ægialites dubius (Scop.), Holdsw. P. Z. S. 1872, p. 471; Legge, Ibis, 1874, p. 28; David & Oustalet, Ois. de la Chine, p. 429 (1877).
Ægialitis fluviatilis (Bechst.), *apud* Hume, Str. Feath. 1873, p. 230; id. Nests and Eggs, iii. p. 572 (1875).
Ægialitis dubia (Scop.), Walden, Trans. Zool. Soc. 1875, ix. p. 227; id. P. Z. S. 1877, p. 701; Hume, Str. Feath. 1879 (List B. of Ind.), p. 112.
Ægialitis curonica (Gm.), Butler & Hume, Str. Feath. 1876, p. 12; Dresser, B. of Eur. pt. 51, 52 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 456.
? *Petit Pluvier à collier de l'isle de Luçon*, Sonnerat; *Le petit Pluvier à collier*, Lesser Ringed Dotterel of some authors; *Lavadeira*, Portuguese; *kleine Pluvier*, Dutch. *Burong Booi*, Sumatra (Raffles); *Shaiarak Chullo*, Turki (Scully); *Zirrea*, Hind.; *Bytu ulanka*, Telugu (Jerdon); *Kotan*, Ceylonese Tamils.
Ola watuwa, Sinhalese.

Adult male and female (Ceylon). Length 6·8 to 7·2 inches; wing 4·3 to 4·7; tail 2·4 to 2·6; tarsus 1·0; middle toe and claw 0·75 to 0·8; bill to gape 0·6, at front 0·53. Females are larger than males.
Iris dark brown; bill black, yellow in some at the base of the under mandible; eyelid yellowish; legs and feet dusky yellow; joints and tips of toes greenish brown.

Male, winter plumage (Trincomalie, 21st November). Head, nape, upper back, scapulars, tertials, and wing-coverts hair-brown, paling on the front of the crown into a broad buff-white band on the forehead; a blackish band passing from the bill through the lores and under the eye to the ear-coverts; a white orbital fringe except at the extreme corner, where it is black; chin, throat, and a collar round the hind neck white; across the chest a blackish band, tinged with buff in the centre, expanding on the sides of the chest, and passing as a narrow edging round beneath the white collar; lower back and rump paler brown than the upper back; primaries black-brown, the innermost narrowly tipped with white; secondaries pale brown, tipped with white, and the innermost with the terminal portion of the outer webs white; 1st primary-shaft white, all the rest dark brown; two central tail-feathers brown, darkening into blackish brown at the tip; next three dark brown, with a quarter inch of the tips white; remainder white, with a black bar on the inner web; under surface and under wing white.

The black band in some does not extend round as a border to the white ring; these are apparently immature birds.

Summer plumage (China). Wing 4·53 inches; tail 2·4; tarsus 0·91; middle toe and claw 0·81; bill at front 0·57. Brown of the back, wings, and tail slightly darker than in winter; a broad black band ($\frac{1}{8}$ inch wide) passing from the bill above and beneath the eye and covering the ear-coverts; a broad antecoronal band of black (0·3 inch) joins the black above the eye, in front of which there is a pure white frontal band separated from the base of the bill

by a black streak; a broad ring of black completely encircles the lower part of the neck, above which a white band passes across the hind neck and joins the white of the throat.

An example shot on the 9th of February in Ceylon is in process of a change to this dress. The loreal stripe and cheeks are brownish black, as in winter; the black band above the forehead is narrow and irregular; the white feathers above the eye are changing to black, and the pectoral band is mixed black and white, and does not extend to the back of the neck.

Young. It is probable that the nestling in down resembles the young of *Æ. hiaticula* of Europe. In this the back and wing-coverts are buff-grey, mottled with black, a dark border running round the flanks, and separating this colour from the white of the under surface; forehead and a broad band across the hind neck white; head, nape, and ear-coverts grey, mottled with black and bordered by a black edging round the nape.

Immature birds in first autumn have the loreal stripe and facial band brown; the pectoral band present in the form of a brown wash across the chest; and the forehead has less of the buff-white than in the adult in winter; the wing-coverts, upper back, and scapulars are edged with buff-grey; tail-coverts tipped with the same, and the central tail-feathers tipped with buff.

Obs. Measurements given by various Indian writers of late are:—♀ (Irrawaddy), length 6·8 inches, wing 4·5, tarsus 0·92, bill from gape 0·7 (*Armstrong*); ♂ (Furreedpore), length 6·75, wing 4·25, tarsus 0·91, bill at front 0·5, weight 1·12 oz.; ♀, length 7·25, wing 4·58, tarsus 0·92, bill at front 0·54, weight 1·37 oz. (*Cripps*); ♂ (Yarkand), length 6·5, wing 4·5, tarsus 1·05, bill from gape 0·6, weight 1·15 oz.; ♀, length 7·0, wing 4·75, tarsus 1·05, bill from gape 0·65, weight 1·7 oz. (*Scully*).

The Marquis of Tweeddale gives the wing-dimensions of seven Lazon examples as 4·25 to 4·5 inches.

European examples range up to 4·7 inches in the wing, and none that I have examined are less than 4·25; the frontal black band *next the bill* is present in all, and does not seem ever to be less than $\frac{1}{10}$ inch in width. I find no difference in specimens from Europe, India, Ceylon, and China, except that as far east as the latter country they seem to average smaller, and perhaps form a connecting-link with the next species.

I do not adopt Scopoli's prior title *dubius*, because his description is founded on an incorrect plate, and consequently does not apply with sufficient accuracy to the species. I have carefully examined Sonnerat's plate; and though it is undoubtedly a representative of a small Ringed Plover, there are mistakes in it which led (on the part of Scopoli) to a decidedly erroneous description, in which we have "*rectricibus nigris, apice albis*," and also "*nigra sunt caput, fascia collaris et caudalis, rostrum, pedes*." So that we have a bird depicted with a black tail tipped with white, and with a black head, bill, and feet! Gmelin's name *curonicus* was given to Beseke's bird from Knrland, which the latter called *Charadrius*, n. sp.? He refers to it in his 'Vögel Kurlands,' p. 66, gives an accurate description of it, and says that Gmelin has named it *Charadrius curonicus*, which title should reasonably be adopted in preference to Scopoli's.

The present species differs from the larger Ringed Plover of Europe, *Æ. hiaticula*, in having the 1st primary-shaft only white, and also in being, as its name implies, smaller. Examples of the larger bird measure:—wing 5·3 to 5·4 inches; tarsus 0·9 to 1·0; bill at front 0·6. The black pectoral band is broader than in *Æ. curonica*.

Distribution.—This little Plover is, according to my experience, migratory to Ceylon, appearing in the island in September, and departing again in April and May. Mr. Holdsworth considers it to be resident, as he observed it at Aripu during most of the year. I never saw it in the Trincomalee district during the hot weather after the month of May. It is not an abundant species, and is chiefly confined to the north and north-east of the island, and almost always found in the maritime districts. I have not met with it anywhere very far inland. It is not included in my list of birds of the Hambantota district ('Ibis,' 1875); but I think I saw it once or twice in that locality. I did not notice it at Galle; but I have seen it on the beach (not the usual locality for it) at Colombo, and have met with it at Kotte and in the Muttnrajawella swamp, and on the islands near Negombo. It is not uncommon in suitable spots in the Jaffna district; but I nowhere saw it in such numbers as between Trincomalee and Tireyeyi. It *may* occur far inland on the banks of the Mahawelliganga. Jerdon observes that it is "found throughout India on open plains, ploughed land, dried-up paddy-fields, and the edges of tanks and rivers, as well as on sand banks and churs." Sykes speaks of a Ringed Plover being found on the shores of fresh waters in the Deccan. I have seen two of his specimens in the India Museum, and they belong to the next species with the large naked orbital ring; but it is probable that he also procured the present bird, as Messrs. Fairbank and Davidson both record it from this region;

but the statement of the latter that it breeds from May till December probably applies to the smaller bird. In Sambalpur and Orissa Mr. Ball met with this species, and he remarks that it is common on the larger rivers of Chota Nagpur; he notes it from many places in the Deccan and also from the Rajmehal hills. Mr. Hume obtained it from Raipur, and notices it as occurring near Calcutta in the winter. In Furrceedpore it is resident, dwelling all the year round on the banks and shores of rivers; and it has been ascertained to breed on the Ganges at Futteghurh. It is found in Kurrachee harbour, on the rivers of Sindh and the Punjab, in Kattiawar, Kuteh, and Jodhpoor in the cold season; and Capt. Butler met with it on the Guzerat plains in the rains. At Sambhur it is common in the cold weather. It was obtained in the delta of the Irrawaddy by Dr. Armstrong, and in Tenasserim it is a cold-weather visitant to the coasts and likewise to inland localities. In the Andamans it is rare, having been only procured by Mr. Davison on South Andaman, and on the Cocos and Preparis. It has been procured in the Malay peninsula and Singapore. In Sumatra Raffles obtained a small Plover which he named a variety of *Ch. hiaticula*, and which we may reasonably consider was this species. In Java it has been obtained by Kuhl, Boie, Van Hasselt, and Horsfield. As regards Borneo, it has been obtained, according to Salvadori, at Tabanio and elsewhere, and more recently Everett shot it at Sibiu. Rosenberg procured it in Celebes. Turning north again, we have Luzon in the Philippines assigned by Sonnerat as its habitat; and in 1877 Mr. Everett obtained seven specimens in this island, which the Marquis of Tweeddale relegates to this species. Swinhoe found it in Hainan and Formosa and in the southern part of China in winter, remarking that it breeds in the north of the empire at Talién Bay. In Japan, Blakiston and Pryer record it from Yokohama, Yezo, Tokio, and Fujisan, and say that it breeds at Yamanaka Lake. Schrenck observed it throughout Amoor Land, and found it abundant on the river; Radde met with it at Tarei-nor in April, and says that it is numerous at Lake Baikal in April. Prjevalsky observes that it breeds in South-eastern Mongolia, and states that he found nests in Ordos and Ala-shan; it arrives first at Dalai-nor about the 9th of April, and is rare at Lake Hanka. Dr. Seully writes that it is a seasonal visitant to the plains of Kashgar, arriving at the end of March, breeding in May, and leaving in September; in the Karakash valley he met with it in August at an elevation of 12,000 feet, and mentions the curious fact of getting a young bird in December. According to Severtzoff it breeds all through Turkestan up to 4000 feet. Mr. Hume records it from Muscat and the Mekran coast. Captain Wardlaw Ramsay met with a pair on the Keria river in Afghanistan in June; and Mr. Blanford observed what he took to be this species at Shiraz in Persia; but in the northern parts of the country it is common in summer. Canon Tristram found it in Palestine on the Kishon. It is common in Asia Minor, European Turkey, and Southern Russia, as also in Greece, in all of which countries it breeds. It migrates through Austria to Germany, where it is common; but in Italy it is resident, although only a visitor in Malta, according to Mr. Wright. In summer it ranges as far north as Northern Russia, Finland, and Scandinavia, up to about 60° N. lat., and breeds in Norway, Sweden, and Southern Finland. It likewise nests in Denmark. To England it is a straggler, having been noted as occurring eleven times, according to Mr. Harting; it has not been noticed in Scotland and Ireland, but is said to have occurred in the Faroes. In Northern France it is rather rare, but in the south it becomes more abundant and breeds in that part of the country. In Spain and Portugal it is common. Mr. Saunders found it breeding near Aranjuez; and according to Col. Irby it is more abundant in summer in Andalusia than in winter: he found it common in Morocco. In Algeria it is tolerably common, a few remaining to breed; it has been met with there by Loehe and by Messrs. Gurney and Salvin. It extends down the west coast to Gambia and the Gold Coast, and was procured at Accra by Governor Ussher; beyond this it is said to have been obtained near the equator by Du Chaillu. In Egypt and Nubia Capt. Shelley says it is resident and abundant throughout the country both on the rivers and in marshes inland. Further south Von Heuglin met with it on the Nile as far as the equatorial region, and also on the Red-Sea shores; but he says that it is not very common and was only observed by him in the winter. On this side it has been known to stray as far south as Mozambique, and has also been obtained as a solitary straggler in the Mauritius. Mr. Wyatt met with it in Sinai at the marshes of Tor.

Habits.—This little Ringed Plover prefers dry and bare fields, waste land, sandy commons, and similar open localities in which there are small pools of water, near which it runs about, feeding on water-insects, minute beetles, tiny snails, and so forth. It is generally found moving about alone, with a companion or two

at some little distance from it; and I have never seen more than half a dozen in the same locality. On the rifle-range at Trincomali, which was a favourite resort in the November and December rains, it consorted with a few Lesser Sand-Plovers which were generally to be found in that place; and I have now and then seen a solitary individual or a pair associating, but not in close fellowship, with two or three Kentish Plovers on open places near tidal flats or land-locked harbours; but it is more often seen unaccompanied by other species, and much more frequently near fresh water than brackish. In countries where there are large rivers it frequents their banks, if they be flat and sandy or composed of pebbly reaches, in preference to any other places. It is not shy in its disposition, and when flushed generally takes a short flight and realights. It may always be known in Ceylon from the Kentish Plover by its stature, which is greater than that of the latter; but more particularly by its plaintive monosyllabic whistle, which may be likened to *pēēi*, *pēēi*, which is uttered generally when it takes flight and occasionally as it runs along on the ground. This note may perhaps consist of a double intonation; but the two syllables sound like one drawn out. Naumann, according to Mr. Dresser, likens it to *diü*, uttered very short, so that the two vowels are almost united. The same author says that "the pairing-note or song begins slowly and is closed with a peculiar trill like the syllables *düh*, *dü*, *düll*, *lüll*, *lüllüllüll*. This note is only heard at the breeding-place, and is more frequently uttered by the male, more seldom by the female, when seated as well as when on the wing, but most frequently when performing the aerial evolutions in which the bird so frequently indulges during the pairing-season."

Nidification.—The Lesser Ringed Plover breeds freely in the northern parts of India as well as in Turkestan and Central Asia. Its nest has been found in the Etawah district, on the Mahanadi, in the Deccan (*Burgess and Davidson*), in Manblum, at Nerbudda, at Islamabad, and on the Jhelum in Cashmir between the month of March and the middle of May. Mr. Hume describes the nest as "a tiny depression scraped, not far from the water's edge, in sand or very fine shingle, by choice on some water-encircled bank, occasionally on some unfrequented part of the river-bank itself. In this, on the bare sand or pebbles, four eggs are laid." He observes that the eggs are imitations of the Kentish Plover's, broad ovals, pointed towards one end, of a "drab fawn- or buff stone-colour," and sometimes of a pale greenish grey, thinly speckled or marked with little hieroglyphic-like lines and figures of brownish purple, blackish brown, or black, beneath which are underlying markings of pale inky purple. They vary in length from 1.1 to 1.23 inch, and in breadth from 0.8 to 0.87.

Concerning its nidification in Europe, we gather from Mr. Dresser's great work that "it nests in places where there is pebbly ground, like those selected by *Ægialitis hiaticula*, and not in localities where there is sand without a strong admixture of small stones. The nest is a mere depression in the ground amongst the stones; and the eggs, which are deposited about the middle of May, are four in number, and are, like those of other Waders, placed with the point inwards." Mr. Robson informs Mr. Dresser that "they have many breeding-places on the coast of the Black Sea, both on the European and Asiatic sea-board, in situations where valleys debouch towards the ocean, their wide fronts covered with sand and pebbles, with shallow streams of fresh water trickling over a narrow surface towards the beach. In natural cavities in the shingle these birds lay their eggs; and in shallow streams near the sea they find their food, water-beetles and the larvæ of insects that come down from the mountains in numerous small streams that unite as they near the coast. . . . On its eggs being approached by man it steals off a short distance, curves its head and tail downwards, and runs in irregular lines, much like a small animal, to decoy the intruder away from its eggs, which result being accomplished, it rises into the air, making a distant whirl, uttering its piping cry, and, gradually lessening the circuit of its flight, alights on the sands and waits a favourable opportunity for returning to its eggs."

A series which I have examined from European localities, in Mr. Dresser's collection, procured in Hungary and South-eastern Europe, are stone-grey, stone-yellow, and some pale brownish clay-colour, marked with small spots and streaky marks of blackish sepia and brown over specks of light lilac or bluish grey; the colouring is pretty evenly though very openly distributed over the eggs, and the linear marks are not so large or so numerous as on those of the Kentish Plover. In some the secondary markings take a linear form. They measure 1.23 by 0.87 inch, 1.15 by 0.73, 1.13 by 0.84. They are broad pointed ovals in shape.

ÆGIALITIS JERDONI.

(THE LITTLE INDIAN RINGED PLOVER.)

? *Charadrius philippensis* (Lath.), Sykes, P. Z. S. 1832, p. 166; Jerdon, Madr. Journ. 1840, xii. p. 212.

Ægialitis minutus (Pallas), *apud* Jerdon, B. of Ind. iii. p. 641 (1864); Legge, Str. Feath. 1875, p. 372 (first record from Ceylon); Hume, *ibid.* 1877, p. 212, et 1878, p. 456 (B. of Tenass.).

Ægialitis philippinus (Lath.), Hume, Str. Feath. 1875, p. 179.

Ægialitis minuta (Pallas), *apud* Hume, Str. Feath. 1878, vii. p. 227; Cripps, *t. c.* p. 300; Hume, *ibid.* 1879, p. 112 (List B. of Ind.).

Ægialitis jerdoni, Legge, P. Z. S. 1880, p. 39.

Adult male and female (Ceylon). Length 6.25 to 6.4 inches; wing 3.9 to 4.25; tail 2.0 to 2.2; tarsus 0.95 to 1.0; middle toe and claw 0.66 to 0.72; bill to gape 0.55, at front 0.45 to 0.50.

In a series of 3 males and 2 females the latter are the smaller.

Iris deep brown; eyelid, which is thick, protuberant, and "corrugated," primrose-yellow; bill black, *basal half* of lower mandible and a spot at the base of the culmen yellow; legs and feet plumbeous, the centre of the tarsus yellowish (in dried specimens the legs turn to a yellowish colour throughout).

Adult male (Kanthelai: August). Back of head, back, wings, scapulars, and tertials light hair-brown; the basal colour of the tail-feathers is a paler brown than in the last species, showing the dark terminal portion as a band; the loreal band is narrower than in the last, and the black does not cross the point of the forehead, which is entirely white to the base of the bill; the black postfrontal band is very broad, and the pectoral band rather narrow, but the black at the back of the neck is rather broader in proportion than in *Æ. curonica*.

Not having procured any specimens of this Plover in the cool season, I am unable to say what the winter plumage is; but it cannot, as a matter of course, differ from that of the last.

Immature. An example shot on the 4th of August at Kanthelai, and in very abraded plumage, has the feathers of the head and back narrowly tipped, and the scapulars and tertials somewhat deeply margined, with brownish rufous. Two others, shot at the same date, have this colour only at the tips of the tertials. This would appear to be the plumage at the end of the first year, just before the second moult.

Obs. There can be no question as to whether this species is distinct from the last, although it comes so close to it that it may only be entitled to the rank of a *subspecies* or *small race*. Its smaller size (the largest specimens only equalling the smallest of *curonica*), the absence, or the very small amount, of black, extending from the lores across the base of the bill, the more conspicuous yellow coloration of the bill, and (in the breeding-season at any rate) the remarkably *protuberant and corrugated fleshy* orbital circle, quite different from the *plain naked* eyelid of *curonica*, will always serve to distinguish it from the latter bird. Jerdon recognized some of these distinctions, and included with them the less lengthened tertials, which is not a reliable characteristic; he likewise stated that the quills were blacker, and the upper plumage of a somewhat darker shade; but neither of these features am I able to discover. I may likewise remark (as some authors have been unwilling to allow the distinctness of this species) that Blyth recognized it, and in a paper in the 'Field,' May 1870, remarked that the little Ringed Plover of South India was peculiar for the much broader naked yellow orbital ring. Jerdon applied to this species Pallas's title *minutus*; and this has been in vogue in India ever since. This was a name given by Pallas, in his 'Zoographia Rosso-Asiatica,' to a small Plover which was obtained on lakes in the steppes of Barabinski, a region lying between the rivers Ob and Irtysh. The description is that of a young bird, as the forehead is said to be whitish, no mention being made of any dark coloration, and the feathers of the upper surface are described as pale-margined. The length of the wing is given as 3.6 inches only, too small for adults of the present diminutive species even; and I agree with Mr. Harting in considering this *Charadrius minutus* to be nothing more than the young of

Æ. curonica, which is found in the district in question. The only other name which has been applied to our bird is *Charadrius pusillus*, Horsfield, given to a species which he described from Java. In 'The Ibis' for 1867, Blyth stated that he had examined the type specimen, and found that it was *Ægialitis ruficapilla*; but in this determination he appears to have been in error; for Mr. Harting has kindly shown me a skin of an immature *Æ. curonica* (wing 4.4 inches) from Formosa, which he says is a facsimile of the Javan type in question, which he examined some years ago. It is necessary, therefore, to propose a new name for this little Ringed Plover; and there can, perhaps, be none more suitable than *jerdoni**, in honour of the great Indian naturalist who was the first to recognize the distinctness of the species.

I have examined specimens obtained by Mr. Anderson in the Futtegerh district, identical in size and markings with my own, and with the same protuberant orbital ring. Mr. Cripps contributes data of a male shot in Furreedpore as follows:—"Length 6.75 inches; wing 4.08; tail 2.1; tarsus 0.92; bill at front 0.46; weight 0.87 oz. Eyelids yellow; legs bluish grey; irides dark brown; bill, base below and gape yellow." In one skin of Mr. Anderson's there is a black edging at the base of the bill; in another the forehead is entirely white, as in my own skins from Ceylon. There is a male example in the Swinhoe collection which has much yellow at the base of the bill, and which, judging by its small size, appears to belong to this smaller form. There is, however, no appearance in the dried specimen of the broad orbital ring. It is an April bird, and measures—wing 4.2 inches, tarsus 0.85.

Distribution.—It was not until the hot season of 1875 that I met with this, the smallest of Ringed Plovers; and as I have not observed it in the cool weather, I cannot state positively that it is resident in the island; but the natural inference to be drawn from the fact of its breeding in Ceylon is that it is a permanent species there. I discovered it on the shores and about the creeks and flat land on the borders of Kanthelai and Minery tanks; and these are the only localities in which I found it. At the former place I did not see it during a subsequent visit in the cool season; but I did not explore the whole of the ground formerly passed over; and to the latter tank I made no trip after the date in question. It remains for future workers in Ceylonese ornithology to discover whether it is a permanent resident, and likewise to satisfactorily identify its eggs.

It appears to be a scarce bird in India. Sykes, in his catalogue of Deccan birds, says it frequents the shores of fresh water there, and is frequently killed in company with "*Sandpipers*;" the latter remark may, however, refer to the last species. From Raipur Mr. Hume has received it; but it is not enumerated in the Chota-Nagpur list of birds. It has not been observed in the Calcutta market, which is sufficient evidence as to its general absence from that locality; but in Furreedpore Mr. Cripps met with a party of four on one occasion, on a sandy chur. In the west of India Captain Butler procured it once at Decsa; and Major Hayes-Lloyd speaks of "*Æ. minutus*" as being common in Kattiawar; but this statement doubtless refers to the last species. From Pegu Mr. Oates sent to Mr. Hume a specimen of a Ringed Plover, which the latter says belongs to this species; it is said to be common on the banks of the Irrawaddy and large nullahs in the cold season; but it was not noticed during the rains. In Tenasserim a single pair were met with by Mr. Davison inland. Whether it extends to the south and into the Malay archipelago, further research will no doubt decide; but as yet I have no evidence of its occurrence lower down the peninsula than the province of Tenasserim.

Habits.—I found this species frequenting the shingly beds of the rivers which supply the great Kanthelai tank with water in the wet season; it likewise affected the dried-up muddy shores of the tank; and at Minery I found it also on the borders of the lake. All I saw were breeding, and their actions were those of the rest of the genus during the time of nidification. They were very tame, and when they were frightened from the spot by my approach, they flew round and settled down behind me, or making wide circles round the spot where I stood would realight in their original position. They ran with considerable speed, and possessed the upright deportment and elegance of action which is characteristic of the last species. Their note differed,

* I must mention here that when exhibiting specimens of the species at a meeting of the Zoological Society a few days since (Feb. 3rd), and suggesting another name for it, the Secretary of the Society recommended my adopting the name *jerdoni*.

however, being a mellow whistle, which, when I approached the vicinity of where they appeared to be nesting, was uttered more loudly and with a sharp finish. In flight they resembled their larger relative.

Nidification.—All my endeavours to find the nest of this species, by putting the bird off it, or by tracing it to the vicinity of its eggs, and then discovering them, were unsuccessful; and I am of opinion that the birds for whose nests I searched had young concealed in the grass or among the stones. However, while taking the eggs of the Stilt and the Kentish Plover on the island mentioned in a former article, I discovered two nests containing eggs different to those of the latter, and which, in all probability, belong to the present species. There were no little Ringed Plovers on the island at the time I found the nests; but they may have flown off when I approached, and might easily have passed unnoticed among the hundreds of Stilts, Kentish Plovers, and Little Terns which were thronging the air and the neighbouring shores in the usual state of excitement manifested when a large breeding-colony is invaded. The nests were situated in strips or deposits of flood-“wreck,” in which little hollows were scraped, and lined with little pieces of dried grass, stick, &c. The eggs were three in number, of a brownish-olive or dusky clay-colour, marked round the larger end with a zone of irregular blackish spots and short streak-like marks, with which the rest of the surface is sparingly covered; others were spotted openly throughout with regular-edged blotches of black, under which were spots of inky grey. In shape they are broad ovals, pointed at the small end, but not compressed, resembling, in fact, the eggs of the Kentish Plover in form. They vary in size from 1.17 to 1.15 inch in length by from 0.85 to 0.84 in breadth.

G R A L L Æ.

CHARADRIIDÆ.

Subfam. VANELLINÆ.

Bill formed as in the last subfamily, but slightly longer. Wings lengthened, as also the legs. Hind toe absent or present rudimentarily.

A spur at the point of the wing in nearly all. Face ornamented with lappets in many. Sternum with two notches in each half, the outer wide and deep, the inner round and closed like a foramen.

Genus CHETTUSIA.

Bill moderate, straight, compressed; the tip horny and elevated; nostrils linear, in a long groove continued to the horny tip. Wings long, pointed; the 1st or 2nd quill the longest; tertials lengthened; a rudimentary tubercle at the shoulder. Tail moderate, even, of 12 feathers. Legs long and tolerably robust. Tarsus covered with reticulated scales, and twice the length of the middle toe; outer toe connected at the base to the middle by a web; hind toe and claw minute.

CHETTUSIA GREGARIA.

(THE SOCIABLE LAPWING.)

Charadrius gregarius, Pallas, Reise, i. p. 456 (1771).

Chettusia gregaria (Pall.), Bp. Iconog. Faun. Ital. Ucc. Introd. p. 115 (1832); Jerdon, B. of Ind. iii. p. 646 (1864); Saunders, Ibis, 1871, p. 386; Holdsw. P. Z. S. 1872, p. 471 (first record from Ceylon); Hume, Str. Feath. 1873, p. 231; Shelley, B. of Egypt, p. 233; Von Heuglin, Orn. N.Ost-Afr. ii. p. 996 (1873); Dresser, B. of Eur. pt. 37 (1875); Butler & Hume, Str. Feath. 1876, p. 11; Davidson & Wender, ibid. 1878, vii. p. 88; Hume, ibid. 1879, viii. (List Ind. Birds), p. 112.

Charadrius wagleri, J. E. Gray & Hardw. Ill. Ind. Zool. pl. 50 (1835).

Charadrius ventralis, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xii. p. 214.

Vanellus gregarius (Pall.), Gould, B. of Eur. iv. pl. 292 (1837).

Sociable Plover of some authors; *Black-sided Plover*.

Adult male, summer plumage (Russia). Wing 8·3 inches; tail 3·7; tarsus 2·5; middle toe 1·1; bill to gape 1·3. Iris brown; bill black; legs and feet black.

Head, nape, and a band from the gape through eye black; forehead and a broad band over the eye to the nape, as also the chin and gorge, white, changing into the rufescent sand-colour of the sides of the neck and ear-coverts; neck below the rufescent colour, chest, interscapulars, and wing-coverts brownish stone-grey, slightly glossed and blending into the rufous of the neck; lesser wing-coverts darker than the rest; secondaries and terminal portion of the greater wing-coverts white; primaries and their coverts black; winglet blackish brown; the edge of the wing pale brown; rump, upper tail-coverts, and tail white, with a large black patch near the tips of the four central pairs of feathers; breast black, changing into rufous on the abdomen; vent, under tail-coverts, axillaries, and under wing pure white.

Female (South Altai Mountains). Head not so black, the loreal stripe scanty; more white on forehead, face, and throat; the chest much paler, and darkening into *blackish* on the breast, the feathers beneath this pale rufous. Wing 7·8 inches. This, I believe, is the usual plumage of the female; but Mr. Dresser speaks of an example in Mr. Harting's collection as being as highly coloured as any male. The breeding-plumage is assumed throughout India in the month of February.

Winter plumage (N.W. Provinces, November 1873). Forehead, lores, and superciliary stripe buffy white; head dark brown; a black stripe behind the eye; face and ear-coverts sandy brown; upper plumage with the feathers finely edged with pale grey; wings, rump, and tail as in summer; chest greyish brown, the feathers pale-edged; chin and throat white, as are also the lower breast and abdomen. This example has some black feathers on the crown, and is acquiring new tail-feathers, which looks as if the head turned black in early winter. The black and rufous underparts cannot well be characteristic of the adult winter plumage, as birds are never seen with them in India until the month of February, when this dress is first assumed. The tail-band extends in some to the penultimate feather.

Nestling. "Head and upper parts white, on the forehead, crown, and back washed with ochre; crown and upper parts spotted and blotched with blackish; the entire underparts white." (Dresser, descr. of pl. 10, Rev. et Mag. Zool. 1870.)

Immature (17th October, Colombo). Length 12·0 inches; wing 8·0; tail 3·4; bare tibia 1·2; tarsus 2·3; middle toe and claw 1·2; bill at front 1·18.

Forehead and broad supercilium buff-white; occiput and nape dark brown, intermingled with black feathers, which cover the crown, and are tipped with white next the forehead; lores, face, and ear-coverts dusky buff, the feathers with dark shafts; a black edging in front of the eye, and a narrow streak behind it; hind neck brown; inter-

scapular region blackish brown; the whole tipped with *rufous-buff*; scapulars and wing-coverts tipped with the same hue, but brown as regards the rest of the feather; centres of the chest-feathers black, the edges buff. The marginal coloration of the upper surface is very different in this example from the adult above described.

Obs. *Chettusia villotiei*, Andouin, the nearest ally of this bird, has the forehead and throat white, paling into light stone-grey on the head; the back and coverts light brown, with a pinkish tinge; the greater coverts and secondaries white, with a band of black above; primaries, rump, tail, and underparts white; chest brown and ashy. Wing 6·7 inches; tarsus 2·2. Bill black, legs and feet yellow (S. Persia).

Distribution.—This fine Plover has been only twice procured in Ceylon; on the first occasion by Mr. Bligh, on the Galle face at Colombo, during the cool season about ten years ago, and on the second by Mr. MacVicar in the same spot on the 17th October, 1873. These are the only instances of its ranging so far south as this island with which I am acquainted; but it may perhaps have been shot by collectors in the north and have escaped notice.

In India its distribution is local, and it is confined to the western side of the peninsula. The most southerly point at which it has been noticed is the Deccan district, in some of the western parts of which it is, according to Messrs. Davidson and Wender, common during the cold weather. I have specimens sent me by the late Mr. A. Anderson from the North-west Provinces, and I fancy that westward of that part it is not uncommon. In the Sambhur district, observes Mr. Adam, it is not very common, being met with sparingly about the plains in the cold weather. In Sindh Mr. Hume often observed it, sometimes about the jheels, but more commonly on waste dry uplands near cultivation; and he remarks that it is common in the cold season all through Jodhpore, Guzerat, Kutch, and Kattiawar. In the neighbourhood of Deesa, writes Captain Butler, it is abundant during the cold weather, congregating in flocks, which vary in number from four or five to fifty or sixty; but it is not so plentiful further south. The date of its arrival he chronicles as the 3rd of October and of its departure as the 10th of March. In Oudh and Kumaon Col. Irby found it very abundant in sandy plains. On leaving India it passes through Turkestan, according to Severtzoff, being met with in the south-eastern and northern portions of the country up to an altitude of 4000 feet. Dr. Scully did not see it in the Kashghar district of Turkestan; but it ranges to the north of that region, as I have seen a specimen (above described) from the South Altai Mountains, in about lat. 47° N., and most probably it breeds extensively between that part of Central Asia and the sea of Aral. It was procured by Pallas in these latitudes; but it does not range as far north as Siberia. It has not been *observed* in Persia, nor in Palestine or Asia Minor, but it must needs pass through the former country on its way north to Europe; at any rate it passes into Arabia, for Mr. Wyatt met with it on the plain of Er Râhah in the peninsula of Sinai. It is rare in Egypt, where Captain Shelley only twice met with it. Von Heuglin writes that it visits North-east Africa regularly in autumn and winter, arriving in Egypt at the beginning of October, and making its way thence southwards to the savannas of Kordofan, Sennaar, and Takah, in flocks of five to fifteen individuals. It appears to migrate into Europe by way of the eastern shores of the Caspian to the Ural and the Volga, and westwards by way of Persia along the south of the Caucasus and across the Black Sea to the Crimea, where Von Nordmann saw large flocks of it. It does not, therefore, range in its journeys so far west as Turkey, and it has not been seen in Greece. In the Ural Mountains, where it no doubt breeds, it ranges on the eastern slope as far north as 59½° N.; and on the Volga it has been met with as far as lat. 53°, in which latitude Bogandoff met with it on the Medvediza, a tributary of the Don. It has strayed as far west as Poland, for there is a specimen in the Warsaw Museum killed near Lublin. It has not occurred elsewhere in Central Europe; but according to Mr. Saunders, *loc. cit.*, it has visited Spain, as he asserts that he met with a half-putrid example in the market of Cadiz in February 1868.

Habits.—The Sociable Plover, as its name implies, lives in flocks of from half a dozen to a hundred or more, and affects plains, waste land, open commons, barren country near cultivation, and sometimes the vicinity of jheels. It is interesting that both specimens which have been procured in Ceylon should have been found on the Galle face, which is a very public locality, but, nevertheless, a very favourite resort of various Plovers. Mr. Hume remarks that it is fearless and tame until shot at once or twice; but Von Heuglin

found it very shy in the savannas of Kordofan and Sennaar; it frequented sandy localities and ground that had been burnt; he observes that they seldom alighted on the ground, but mostly moved in quick low-flying flocks over the plains, sometimes crossing the caravan-roads, which gave him an opportunity of shooting several from horseback; otherwise it was not possible to get near them. They were, as a rule, quite silent; but now and then he heard it utter a shrill, short whistle. He found its food to consist of grasshoppers, spiders, beetles, and larvæ. In Sindh this Plover seems to be a favourite quarry of the Laggar Falcon. Capt. Butler, writing of a pair of these Falcons and a flock of Lapwings, remarks that when the latter saw their enemies approaching they "used to rise in a flock closely packed together to an immense height in the air, wheeling and darting in all directions. It was of no use, however, trying to escape, the two Falcons would follow them up until an opportunity occurred, and then one of them, with a velocity beyond description, would make a stoop into the midst of them and strike its victim, descending with it in its claws slowly to the ground."

Nidification.—Little is known respecting the nesting of this species. Mr. Dresser describes an egg sent to him by Mr. Möschler, taken near Sarepta, as closely resembling those of the common Lapwing, but somewhat paler in ground-colour, and more sparingly marked with spots and blotches.

Genus LOBIVANELLUS.

Bill much as in the last genus, but longer; a lappet of nude red skin proceeding from the anterior corner of the eye and impending the lores. Shoulder furnished with a tubercle, which develops at the breeding-season. Tail as in *Chettusia*; legs longer and more slender. Tarsus nearly three times as long as the middle toe; outer toe attached to the middle at the base; hind toe and claw very small.

LOBIVANELLUS INDICUS.

(THE RED-WATTLED LAPWING.)

Tringa indica, Bodd. Tabl. Pl. Enl. p. 50 (1783).

Parra goensis, Gm. ed. Syst. Nat. i. p. 706 (1788).

Vanellus goensis (Gm.), Sykes, P. Z. S. 1832, p. 165; Gould, Cent. Him. B. pl. 28 (1832); Jerdon, Madr. Journ. 1840, xii. p. 214.

Lobivanellus goensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 261 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109; Jerdon, B. of Ind. iii. p. 648 (1864); Legge, Ibis, 1874, p. 27, et 1875, p. 401.

Lobivanellus indicus (Bodd.), Schlegel, Mus. P.-B. *Cursores*, p. 68 (1864); Holdsw. P. Z. S. 1872, p. 472; Hume, Str. Feath. 1873, p. 232; Ball, *ibid.* 1875, p. 209; Hume, Nests and Eggs, iii. p. 574 (1875); Butler & Hume, Str. Feath. 1876, p. 14; Hume, *ibid.* 1878, vii. p. 67; Davidson & Wender, *t. c.* p. 88; Ball, *t. c.* p. 227; Cripps, *t. c.* p. 300; Hume, *ibid.* 1879, viii. p. 112 (List B. of India).

Goa Sandpiper, Gmelin; *Indian Lapwing*, *Plover*, *Pewit*; "Pity to do it," "Did you do it?" Sportsmen, from their cry. *Titai*, *Titi*, *Tituri*, *Titiri*, in different parts of India; *Yennepa chitawa*, Telugu (Jerdon); *Verklikker*, Dutch in Ceylon; *Al-kati*, Ceylonese Tamils, lit. "Man pointer."

Kiralla, *Kibulla*, Sinhalese.

Adult male and female (Ceylon). Length 12.6 to 13.0 inches; wing 8.0 to 8.4; tail 3.9 to 4.3; tarsus 3.0 to 3.1; bare tibia 1.5; middle toe and claw 1.2 to 1.42; bill to gape 1.3 to 1.4; spur, in the breeding-season, 0.2. Females are the smaller.

Iris brick-red or greyish red, paling at the outer edge; orbits, lappets, and two thirds of bill from base coral- or lake-red (the bill often inclining to pink); remainder of bill black; tibia yellow; tarsus sickly or greenish yellow; toes greenish yellow, claws black; alar spur reddish.

Head, hind neck, face, throat, fore neck, chest, quills, and a broad band across the tail glossy black, the wings and tail not so intense as the head and neck; a broad band passing from the posterior margin of the eye over the ear-coverts, down the sides of the neck and chest, together with the under surface, under and upper tail-coverts, and tail, tips of greater wing-coverts, and most of the secondaries white; lower part of hind neck, back, rump, wing-coverts, and tertials pale brown, with a strong green lustre, and glossed with amethystine on the wing-coverts and scapulars; the white of the secondaries increases towards the innermost feather, which has only the tip black, and the adjacent tertiary is all white. The amethystine hue varies in individuals, extending in some to the back and longer tertials.

Young. The immature bird in first plumage has the iris brown, base of bill reddish, remainder black; the lappets partially developed. Forehead and lores greyish; crown brownish; the chin and throat white, in some mottled with fulvous, and the surrounding plumage of the neck dull black; the upper surface and wings duller than in the adult, with fulvous edgings to the feathers.

Some examples in what may be a further stage have the iris "traced" with brown pencillings, and the white of the under surface tinged with buff.

Obs. A comparison of a fine series of this bird in the national collection demonstrates that continental examples are somewhat longer in the wing than Ceylonese. Specimens from Kamptee, Nepal, and other districts measure:—8.6 to 9.2 inches; tail 4.5 to 4.8; tarsus 2.8 to 3.1; bill to gape 1.3 to 1.4.

In the green and vinous tints of the upper surface, the breadth of the white side neck-streak, marking of tail, &c. they correspond with my skins.

L. atronuchalis, Blyth, the Burmese representative of this species, is *closely* allied to it, differing in the black of the hind neck being of greater extent and ending abruptly at the lower part next the back, where there is a white band, and also in the side neck-stripe being narrower and shorter, ending a little below the ear-coverts. Wing 8.5 inches; tail 4.3; tarsus 3.1 (Brit. Mus.).

In Australia are two species of this genus, *L. lobatus* (Vieill.) and *L. personatus*, Gould. The former has very large wattles; in a specimen shot by me they measured, before shrinking, 1.3 inch in length, wing 9.9. Head, neck, and sides of chest black; upper surface greyish brown; wings black, beneath white. The latter species is the North-Australian representative of *L. lobatus*, differing in having the entire neck white, the top of head only black, and the wattles extending more over the face and more pointed at the tips.

Distribution.—This Lapwing, though widely distributed throughout the low country, is somewhat partial in its choice of locality. It is very common in the northern half of the island, as also in the north-western and better-watered eastern districts, being in these parts found at almost every tank and jungle-begirt paddy-field that one visits. In the Western Province it is also abundant, but is chiefly found on pasture-land; and about Bolgodde frequents marshes and the drier portions of large paddy-fields. In the Amblangoda, Wackwella, and Baddegamma fields and pastures, as also about Matara, it is to be met with in moderate numbers, and is likewise seen further east towards Tangalle and beyond that place. In the dry maritime region of Hambantota the next species takes its place principally, though it may there be met with about tanks and marshes in the jungle. Further north, in the Wellaway Korale it is again more common, and ascends the hills near Lemastota to a considerable altitude. It is also to be found on the Uva patnas at times, where Mr. Bligh has seen it near Banderawella at an altitude of about 4000 feet. It likewise frequents suitable localities in Dumbura, but, I understand, chiefly in wet weather, when it is a visitor to that upland from the low country.

In India it is, writes Dr. Jerdon, one of the best-known birds in the country, extending from the extreme south up to Cashmir, to the west of which, in the Suliman hills, Mr. Ball met with it in the higher valleys up to an altitude of 3500 feet. In the Persian Gulf Captain Butler procured it on the island of Henjam. In the north-western corner of the peninsula, composed of Cutch, Kattiawar, and Guzerat, it is common, and in Sindh is everywhere abundant, though not so much so, according to Mr. Hume, as in the North-west Provinces. About the Sambhur Lake it is, says Mr. Adam, very plentiful, breeding there from March until July. In Guzerat, Captain Butler finds that it is to some extent migratory, being scarce in the hot weather. In Oodeypore Mr. Hume met with it at Kunkrowlee Lake in February; and in Jodhpoor, during the prevalence of a drought in the cold season of 1877-78, he found one or more pairs about every hamlet. In the north-west, as also in the lower provinces of Bengal, it is common. In Furreedpore Mr. Cripps found it to be a permanent resident; but further east it becomes scarce, for in North-east Cachar it is only a straggler in March and April, and in Burmah it is replaced by the allied species above mentioned. Mr. Ball records it from most places in Chota Nagpur, from Orissa (north of the Mahanadi), and from the Godaveri valley. In the Deccan it is abundant, and is found, says the Rev. Dr. Fairbank, by every stream in the Khandala district. In the south it is found in the hill-country of Travancore, and in the lowlands is, I imagine, common.

Habits.—This is one of the most well-known Waders in Ceylon, taking there the place of the equally familiar Lapwing in the British Isles. In common, however, with many other species which are so very tame and familiar in India, it is not so fond of the vicinity of human habitations as it is on the mainland; for although it may be found on pasture-land surrounding villages and hamlets and even close to cottages, it prefers more unfrequented localities, such as the borders of paddy-fields, edges of marshes, meadow-land surrounding large tanks, or the margins of the smaller village ones. Though not strictly a shy bird, it is wary enough to rise when approached before one is within shot of it, and then, when flying round the place from which it has been disturbed, uttering its well-known cry in true Lapwing fashion, it manages to keep at a respectable distance from the intruder. When on the wing or when approached while on the ground, particularly at night, it is constantly uttering its harsh and rather amusing notes; these consist of a shrill cry, followed by others resembling the words "Pity to do it," "Did you do it?"—which are particularly annoying to the inexperienced

sportsman, as they are always vociferously given out after having been fired at and missed! At night it is a most watchful bird, and ever ready in the jungle to alarm slumbering nature around it with utterance of these cries. When watching for deer, on a moonlight night, behind an ambush, or, as it is called in North Ceylon, a "shade," of newly-cut boughs, and employed in the somewhat monotonous sport (?) of intently gazing through a small opening in my lair at a water-hole some fifteen yards in front of me, I have had these troublesome birds run close up, and, finding me out, rise with loud cries of "Pity to do it;" and whether it was a pity or not to do it, I used to find that after this alarm the deer gave the water-hole a wide berth, and did not come to drink! Layard alludes to this habit of annoying the native tank-shooters, by whom, it may be remarked, the market at Trincomalee used to be supplied with venison; and in India the same notes have gained for it its popular name of "Did you do it?" Jerdon observes that in the "south of India it is recorded to sleep on its back with its legs upwards; and the Indian proverb '*Tititira se asman thama jaega*,' &c., 'Can the Plover support the heavens,' is applied to a man who undertakes some task far above his strength." The flight of the Indian Lapwing very much resembles that of our own home bird, being performed with vigorous beatings of its ample wings; but it does not twist and tumble about in the air so much as the latter. Its food consists of worms, crickets, beetles, and aqueous insects; and it may not unfrequently be found in newly-burnt clearings in the low country jungles searching for larvæ &c. in the charred and blackened soil. Col. Sykes records the finding of corn in its stomach. When pressed by hunger it feeds on offal even, concerning which degraded taste Mr. Hume writes, in speaking of its habits during a drought in Jodhpore:—"Strange to say, the Lapwings had taken up their abode, like the madmen of old (and mad they must have been to eling to such a place as Jodhpore was when I was there), 'amongst the tombs.' Outside each village is a bovine Golgotha, to which all the carcases of the cattle which die are, after being skinned, dragged—first, apparently, to ensure a pleasant smell (from a native point of view), and, secondly, for the delectation of the village dogs, the jackals, and vultures. Now at this time of drought it was invariably amongst the skeletons, generally inside the ribs of some hapless and diseased bullock, that I found *L. indicus* (a veritable disgrace, as I remarked to some of them, to their genus), feeding on fly-maggots and small fragments of putrid flesh."

Nidification.—This Lapwing breeds in the Western Province in May, June, and July, and in the latter month I have taken its nest at Hurullé tank, not far from Anaradhapura. It chooses an elevated spot in a meadow, a bund in a paddy-field, or a dry place in a marsh or weedy tank, and scrapes out a hollow in the soil, which is sometimes lined with little rounded pellets of mud, which have the appearance of being made by the bird with its bill; amongst these are mixed some dried grass-stalks cut up into short pieces, and tiny twigs or fragments of leaves. The interior of the nest is sometimes of the same colour as the eggs, which are generally three in number and of a stone-grey or olive colour, much stained or clouded with dusky bluish grey, and over this thickly covered with short streaks, blotches, spots, and markings of all shapes of blackish sepia, which are thickest round the large end. They are pyriform in shape, and rather small for the size of the bird. A small series in my possession measure 1.62 to 1.71 inch in length, and 1.15 to 1.2 in breadth. When frightened from her eggs the parent bird stealthily leaves the nest and flies to a little distance, alighting and running to and fro; but when young are concealed in the grass the old birds are very noisy, flying round and round with loud cries. In India, particularly in the wet season, when its usual haunts are flooded, this Plover resorts to all kinds of places to nest, and manifests an utter disregard of man. Mr. Hume, after mentioning that it breeds throughout India in the plains and hills up to 4000 feet, writes, in 'Nests and Eggs,' as follows:—

"The breeding-season lasts from March to August, and I rather suspect that they have two broods; but I am not sure, for the great bulk of the birds lay in April, May, and June. . . . They lay almost anywhere, provided there is water somewhere in the neighbourhood. Banks of rivers, edges of swamps or ponds, well-irrigated gardens, are their favourite nesting-sites until the rain falls; after the rains have well commenced they like drier situations. It is very usual then to find their eggs amongst the ballast of a railway (often in such a situation that the footboard of every carriage passes over the bird's head) or on the top of a hedge-bank, in an old brick-kiln, or in any well-drained situation; in fact a pair that had frequented my garden all the cold season at Mynpooree, laid on the top of my flat-roofed two-storied house and hatched their young there, and the second day had the young down in the garden. How they carried them the 40 feet from the

parapet of the roof to the ground I could not ascertain. These particular eggs had been kept in their places on the flat roof by a circle of fair-sized pieces of mortar, heavy enough to resist the strong winds which often in Upper India usher in the rainy season. Very generally the eggs are laid in a simple depression in the earth; but not unfrequently the hollow is surrounded by a little circle of stones or a little ridge of sand."

The ground-colour in a large series is in some reddish buff, and in others coffee-coloured, or again pale olive-green. The average size of a large series is, writes Mr. Hume, 1.64 by 1.2 inch.

Genus LOBIPLUVIA.

Bill shorter and wider at the base than in the last; base of the lappets extending from the eye to the culmen. Wings long, much pointed, when closed reaching beyond the tail; the 2nd quill the longest, 3rd as long as the 1st. Tail of 12 feathers, shorter than in *Lobivanellus*, even at the tip. Legs long and slender; toes short; hind toe wanting.

LOBIPLUVIA MALABARICA.

(THE YELLOW-WATTLED LAPWING.)

Charadrius malabaricus, Bodd. Tabl. Pl. Enl. p. 53 (1783).

Charadrius bilobus, Gm. ed. Syst. Nat. p. 691 (1788).

Vanellus bilobus (Gm.), Sykes, P. Z. S. 1832, p. 208; Jerdon, Madr. Journ. 1840, xii. p. 213.

Sarciophorus bilobus (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 261 (1849); Jerdon, B. of Ind. iii. p. 649 (1864); Blyth, Ibis, 1867, p. 165; Beavan, Ibis, 1868, p. 390; Layard, Ann.

& Mag. Nat. Hist. 1854, xiv. p. 108; Morgan, Ibis, 1875, p. 323; Legge, *t. c.* p. 407.

Sarciophorus malabaricus (Bodd.), Holdsw. P. Z. S. 1872, p. 472.

Lobipluvia malabarica (Bodd.), Hume, Nests and Eggs, iii. p. 577 (1875); Butler & Hume, Str. Feath. 1876, p. 14; Davidson & Wenden, *ibid.* 1878, vii. p. 88; Ball, *t. c.* p. 227; Hume, *ibid.* 1879, viii. p. 112 (List B. of Ind.).

Jithiri, N.W. Prov.; *Al-Kati*, Tamil (Jerdon); *Zirdi*, Hind.; *Verklikker*, Dutch in Ceylon; *Teteue*, Portuguese in Ceylon (Layard).

Kirella, Sinhalese.

Adult male and female. Length 10·5 to 11·25 inches; wing 7·7 to 7·8; tail 3·0; tarsus 2·3 to 2·4; middle toe and claw 1·0 to 1·1; bill to gape 1·25, at front 1·0.

Iris yellowish or grey, with a brown outer edge; eyelid and wattles lemon-yellow; bill black, greenish yellow at the base; tibia and tarsus yellow; feet dingy yellow, claws black.

Top of the head and nape black, bounded by a white border running round the nape from the posterior corner of the eye; hind neck, back, scapulars, and wing-coverts pale earth-brown, passing into a lighter or greyer hue over the fore neck, throat, and chest; chin, gorge, and edge of brown pectoral region blackish; upper tail-coverts, tail, under surface, under wing- and under tail-coverts, the tips of the secondary coverts and base of secondaries, with the outer webs of some of the underlying tertials, white; quills and a subterminal band on all but the two outer rectrices black, preceded on the central pair by a smoky wash. In examples not fully adult the black caudal band extends to the penultimate.

Young. Birds of the year have the head dark brown, edged fulvous; the white nuchal border as in the adult; neck, back, and wing-coverts olive-brown, palest on the fore neck, each feather edged with fulvous; quills as in the adult; forehead and chin whitish, the caudal band extending to the penultimate, and the outer web of the lateral rectrix smoky grey. In the second year the chin is blackish, and the head becomes black, specimens being commonly procured with the head-feathers mingled brown and black.

Obs. Ceylonese birds appear to average smaller than those from the mainland. I find that in a large series examined in Mr. Harting's collection, and in the Indian and British Museums, the wing varies from 7·6 to 8·0 inches, and the tarsus from 2·3 to 2·6, the smallest specimens being from Southern India, and the largest from the Calcutta district and Darjiling.

The Spur-winged Plover (*Hoplopterus ventralis*, Cuv.), which inhabits India as far south as the Godaveri, though not likely to occur in Ceylon, is worthy of notice. It is a larger bird than the present, with very sharp long black spurs at the shoulder at all seasons; the head is furnished with a long crest, and both are black, as well as a broad band down the throat and a large patch on the abdomen; the lesser wing-coverts at the point of the wing are also black, forming a band adjacent to the white greater coverts and secondaries; wings and terminal half of tail black; chest ashy grey, beneath with the basal part of the tail and under wing white. Wing of a specimen before me 7·9; tarsus 2·7; bill at front 1·15.

Distribution.—This handsome Plover is partial to the dry districts of Ceylon. It is, I imagine, more numerous in the north-west, from Jaffna down to Aripu, than anywhere else in the island; and Mr. Holdsworth

speaks of large flocks frequenting that neighbourhood in winter. Though I have met with it on the north and along the north-west coast, I never observed it at Trincomalee, nor anywhere in that district, and between there and Batticaloa it was rarely seen by me. Southward of this place it occurs not unfrequently; and between Hambantota and Yāla it is common and resident throughout the year, though it is there only an occupant of the maritime region, being replaced in the interior by the last species. In the Galle district it is, as far as my experience proves, entirely wanting. I understand that it has occurred in the Colombo district, but only as a straggler in the N.E. monsoon; I have not myself seen it south of Chilaw, where, as also further north, about Puttalam, it is not uncommon. At the latter place Mr. Parker has observed it, and has met with it far inland, halfway between Nikawaretiya and Anaradhapura. As a rule I do not think it strays much into the interior; but I have seen a young specimen at Mr. Whyte's which, I was given to understand, was shot in Dumbura.

In India it is found throughout the greater part of the country, but is confined, according to Mr. Hume, chiefly to the dry uplands. Mr. Bourdillon records it from the Travancore hills; but at what elevation he does not mention. I conclude that it inhabits the Carnatic in suitable localities, for Mr. Morgan found it breeding in that part; and as it inhabits the island of Ramisserum, is probably found in the Tuticorin district. In the Deccan it is common, according to Messrs. Davidson and Wenden, and is spoken of by Col. Sykes as affecting dry stony places in that region. In Chota Nagpur it is, says Mr. Ball, rare compared to the last species; but nevertheless pretty generally distributed; he records it from the Rajmehal hills, Birbhum, Manbhum, Lahardugga, Sambalpur, Orissa, Raipur, and the Godaveri valley. It is pretty common in some seasons at Calcutta, but appears to be absent in some years altogether. Mr. Hume, for instance, does not seem to have noticed it at all in the bazaars there, whilst Blyth says that it is not uncommon at times. Further east than this district it probably does not extend, as I find no record of it in 'Stray Feathers;' but there is a specimen in the British Museum from Darjiling. It inhabits the North-west Provinces, and breeds in Oudh. Towards the west it is not by any means numerous. Captain Butler says that it is not very common in the plains of Guzerat, and does not ascend to the hills. Throughout the surrounding districts of Cutch and Kattiawar it occurs; but is very rare in Jodhpore, and has only been once found in Sindh, on which occasion Major Le Messurier met with it near Kurrachee. In the northern portion of the province, writes Mr. Hume, it is unknown. It does not occur in Guzerat in the hot weather.

Habits.—The Yellow-wattled Lapwing, as I have already indicated, is an inhabitant of dry places, and quite avoids the moist damp lands, fields, and marshes which are the chosen grounds of the last species. I have always met with it in perfectly parched-up spots, such as are to be found lying between or around the leways and salt lagoons of the south-east of the island. Here, on the gently sloping land between the edge of the dense thorny scrubs, or on the dried-up soil, covered in the wet season by the waters of the lagoons, but then thoroughly baked and powdery in consistency, these birds were to be found in pairs or three or four together in scattered company. They are wary in their disposition, not permitting so near an approach as the last species; and I have found on emerging from the thorny fastnesses surrounding these great haunts of Waders that they would be on the wing (if anywhere near) before a hasty glance could be taken of what species were within shot, or else they were to be seen at a distance standing motionless and intently surveying the intruder who had so unexpectedly appeared on the lonely scene. In such solitudes, however, birds are often shier than they are in more frequented localities. The present species appears to be perfectly at home in these hot and arid wastes; and were it not that in tropical climates insect-life abounds everywhere, it would be difficult to realize that such spots could constitute feeding-grounds for the smallest of birds. The Aripu district, where Mr. Holdsworth met with this bird, consists of open plains, studded with low bushes and stunted groves of trees, and bears some resemblance to the Hambantota country. It subsists on ants, termites, small beetles, and other insects. Its flight is swifter and more regular than that of the Common Lapwing, and its note differs in being a shrill but somewhat plaintive cry of three syllables.

Nidification.—This bird breeds in the Hambantota district in June and July. A nest I found near one of the salt-pans not far from the town was situated near a pathway leading out of the jungle, and crossing an open grass-plot to the water, which was not far distant. It was a hollow excavated in the sandy ground and

devoid of lining, and contained four eggs, which were on the point of hatching ; but the old bird was nowhere to be seen ; on my returning the following day to identify the eggs, I found a Yellow-wattled Lapwing at the nest, and three eggs hatched off, but the young nowhere to be found, though I searched diligently for them. The eggs were pyriform in shape, of a stone-yellow ground-colour, blotched evenly all over with three shades of sepia, the darkest and richest markings being the largest ; under these were small greyish-blue blotches. The egg which I took measured 1.46 inch in length by 1.12 in breadth. The old birds, which were both present, were very noisy, flying round and round like the last species, but not approaching so near to me. Layard describes the eggs as "rich nankeen, plentifully spotted with rather large blotches, some of which are dark brown, others grey, of a deeper or paler shade, and thickest at the obtuse end." The measurements he gives are 1.58 inch in length by 1.25 inch in breadth.

In India the Yellow-wattled Lapwing breeds in April and May throughout the plains and dry uplands. According to Mr. Hume the nests are usually in waste lands, known in Upper India as "*Osar maidans*," rarely in ploughed lands, never on sand banks or in the close vicinity of rivers or tanks. He observes, "on one or two occasions I have found the eggs overshadowed and more or less hidden by tufts of grass ; but usually the nest is out in the open, without any attempt at concealment.

"The nest is a small circular depression scooped out by the bird, and entirely unlined, some 3 to 4 inches in diameter and an inch in depth, and often with a little earth, or a number of tiny pieces of kunker, scraped up against the margin all around, so as to deepen the cup. The eggs are always four in number." They are described as "buffy or pale greenish or olive stone-colour, pretty thickly studded with spots, streaks, and moderately-sized blotches of deep brown, interspersed with spots and streaks of pale olive-brown and dingy inky purple." Average size of twenty-two eggs 1.45 by 1.07 inch nearly.

G R A L L Æ.

Fam. ŒDICNEMIDÆ*.

Bill in one group stout and large, in the other smaller and somewhat slender. Wing long, with a blunt tubercle at the point. Tail short, of 12 feathers. Legs long, the tarsus with similar scales before and behind ; hind toe wanting ; toes webbed at the base. Eye large.

Sternum with a single deep emargination. Stomach membranous. With no change of plumage in the breeding-season.

* The members of this family might perhaps, with greater propriety, be included among the Otidæ as a subfamily ; but as the true Bustards are wanting in Ceylon, I prefer to keep the Thicknees and Coursers separate by themselves.

Subfam. ŒDICNEMINÆ.

Bill stout, straight, the gape angulated, the gonys much pronounced. Legs long and rather stout, with the knee-joints enlarged and the tarsus reticulated before and behind; toes webbed at the base.

Of large size, with the head and eye very large, and of nocturnal habits.

Genus ŒDICNEMUS.

Bill large, stout, wide at the base, moderately long, the tip curved from the nostril, which is placed in a depressed and capacious membrane; gape angulated, commissure curved below the nostril and then ascending to the tip; gonys short and strongly angulated. Wings long, 2nd quill the longest. Tail graduated and cuneate at tip. Knee-joints enlarged. Tarsus more than twice the length of the middle toe, and covered with polygonal scutes; toes stout and webbed at the base. Head and eye large.

ŒDICNEMUS SCOLOPAX.

(THE STONE-PLOVER.)

Charadrius œdicnemus, Linn. Syst. Nat. i. p. 255 (1766).

Charadrius scolopax, S. G. Gmel. Reise, iii. p. 87, pl. 16 (1774).

Œdicnemus crepitans (Linn.), Temm. Man. d'Orn. ii. p. 521 (1820); Gould, B. of Eur. iv. p. 535 (1832); Sykes, P. Z. S. 1872, p. 166; Jerdon, Madr. Journ. 1840, xii. p. 215; Blyth, Cat. B. Mus. A. S. B. p. 260 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Jerdon, B. of Ind. iii. p. 654 (1864); Holdsw. P. Z. S. 1872, p. 472; Von Heuglin, Orn. N.Ost-Afr. ii. p. 985 (1873); Hume, Str. Feath. 1873, p. 232, et 1875, p. 182; Legge, Ibis, 1875, p. 401; Butler & Hume, Str. Feath. 1876, p. 14; Armstrong, t. c. p. 340.

Œdicnemus indicus, Salvadori, Atti della Soc. Ital. Scien. Milano, viii. p. 370 (1866); Hume, Nests and Eggs, iii. p. 581 (1876); Ball, Str. Feath. 1878, vii. p. 227.

Œdicnemus scolopax (S. G. Gm.), Dresser, B. of Eur. pt. 55, 56 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 458, et 1879, viii. (List of Ind. B.), p. 112.

Grand Pluvier ou *Courlis de terre*, Buffon; *Le Grand Pluvier*, Buffon, Pl. Enl. 919; *The Great-headed Thicknee*, *The Norfolk Plover*, *Stone-Curlew*, *The Thicknee*, popularly in England; *Bastard Florikin* in India; *Alcaravan*, Spanish (Saunders). *Karwanak*, also *Barsiri*, Hind.; *Lambi* of Falconers; *Kharma*, Bengal.; *Kalleydu*, Telugu; *Kana mosal*, Tamil, lit. "Jungle-Hare" (Jerdon); the same in Ceylon.

Adult male and female (Ceylon). Length 15·75 to 16·5 inches; wing 8·25 to 8·6; tail 4·5; tarsus 3·1 to 3·2; middle toe and claw 1·5; bare tibia 2·0; bill to gape 2·05, at front 1·0. Iris yellow, mottled and pencilled with dark brown; bill black, greenish yellow from base to end of nostril-membrane

and beneath as far as the chin; legs and feet pale greenish yellow, bluish on the joints and toes. Some individuals have the culmen black up to the forehead, or nearly so, and it remains to be shown whether this is a sign of age or the reverse.

Head, upper surface, greater wing-coverts, tertials, and central rectrices ashy brown, palest on the hind neck, tail, and rump, and darkest on the head and scapulars; the centres of the feathers blackish brown, and the margins rufescent; coverts above the inner blackish brown, with brighter rufous margins than elsewhere, the next row barred across the centre with white, and the greater coverts with deep terminal margins of white, forming two bars across the wing, between which is a blackish band; quills and tail brownish black; a bar across both webs of the 1st and 2nd primaries and the inner web of the 3rd, another extending from the 9th to the inner web of the 6th, as also the tips of the 7th and 8th, and a subterminal band across the tail white; basal portion of tail-feathers crossed with light bars; lores, superciliary stripe, cheeks, chin, throat, and under surface white; a stripe beneath the eye from the anterior corner, another from lower mandible to the ears, and the centres of the feathers on each side of the middle of the fore neck, as also on the chest, blackish brown; under tail-coverts pale rufous.

Young in down (Norfolk, coll. Harting). Above greyish buff, the down short and tipped with brown; two narrow well-defined black stripes pass up the back from the rump to the neck and meet on the crown; a narrow stripe runs from the eye and joins those on the nape, and one from the centre of the forehead passes over each eye; a black stripe from the tail along the side of the rump to the wings, and one on the wings; beneath buffy white, tinged with greyish on fore neck.

Obs. A small series from India which I have examined do not differ materially from Ceylonese birds; the central stripes of the upper-surface feathers vary in width, and the bill is subject to considerable variation in size. Indian specimens in the British Museum and Mr. Harting's collection measure:—Wing 8.4 to 9.7 inches; tarsus 3.0 to 3.4; bill at front 1.6. Mr. Hume remarks that Indian examples average smaller than European, and on this account the race was separated by Salvadori as *Æ. indicus*; but dimensions vary, as Sindh birds are larger than Upper Indian ones. A fine example of the pale or desert form which this species assumes in arid climates, lately sent to England from the Attrek river, has the upper plumage yellowish sandy brown, and the central tail-feathers are sandy mottled with brown; wing 9.0 inches, tarsus 3.0, bill at front 1.4. Two Egyptian examples measure, wing 9.4 to 9.6 inches, tarsus 2.8, bill at front 1.7, and two killed in England, wing 9.4 inches; so that Indian specimens attain to quite the size of European and Asiatic. Autumn birds after moulting have the marginal portions of the back-, scapular, and wing-covert feathers a brighter rufescent than they are some months afterwards, when they have become, through time and exposure, of a greyish hue and are often much abraded. *Æ. senegalensis*, Swains., is a closely allied species, somewhat smaller (wing 8.6 to 9.0 inches), and has no upper white wing-bar, the lesser and median coverts being brownish grey with black central stripes; the upper-surface feathers are grey-brown, with narrower central black feathers than in *Æ. scolopax*. There are several other species of this fine genus, one of which, *Æ. maculosus*, Cuv., from South Africa, is very handsomely marked; another, *Æ. grillarius*, Lath., from Australia, is remarkable for its large size and lengthened tail, and has been separated as *Burhinus*, Illiger. An example in Mr. Harting's collection measures—wing 11.75 inches, tail 6.5, tarsus 4.8. The under surface is whitish, and the chest and breast marked with bold stripes of black.

Distribution.—The "Thicknee," though widely distributed in Ceylon, is by no means a very common or a plentiful species. Layard considered it to be "much more frequent" than the last; but my experience has been the reverse. I conclude, therefore, that it is tolerably abundant in the Jaffna peninsula, in a portion of which, the Pt. Pedro district, he resided, and near which I have seen it in jungly wastes at Ethelmaduvel, not far from the Elephant Pass. Mr. Holdsworth speaks of it as common at Aripu at all seasons. In the Trincomalee district it was found in pairs, or two or three together in certain places, and I always noticed it more during the latter end of the year than in the hot weather, when it probably retired to secluded spots to breed. Near Batticaloa it is to be found in the sandy scrubs; and in the islands in the Lake I have met with it in August, when it appeared to be breeding. In the Hambantota district it is resident, but on the west coast I have only noticed it during the north-east monsoon. It is then to be found as a straggler in the Morotuwa, Colombo, and Negombo cinnamon-gardens, which places appear to be its only resort in that part of the island. Mr. Parker has met with it at Puttalam; and it is probably resident there, as no doubt also at Chilaw. It is evidently a dry-climate species, mostly avoiding damp districts, and in Ceylon confining itself to the sea-board.

Jerdon remarks that this Stone-Plover is found in most parts of India down to the extreme south, and says that it is more rare in Malabar and Lower Bengal than in other districts. Mr. W. Morgan writes, in 'The Ibis,' 1875, that he found it breeding near Kurnool in May. In the Deccan it is not uncommon, according to Messrs. Davidson and Wenden; and the Rev. Dr. Fairbank records it from the Khandala district. In Chota Nagpur it is rare, but met with sometimes in jungle, the districts in which Mr. Ball observed it being enumerated as the Rajmchal hills, Manbhum, Lohardugga, Singhbhum, Sirguja, Sambalpur, Orissa, and the Godaveri valley; and from Raipur Mr. Hume has received it. About Calcutta it is rare, and from Furreedpore it is not recorded at all. Towards Burmah it is scarce. Captain Feilden procured a single specimen near Thayetmyo. Mr. Blanford met with a considerable flock on the Irrawaddy in September; and on the delta of the same river Dr. Armstrong observed it rarely. In Tenasserim it is confined to the plains country of the central portions of the province, and is rare there. It is found in pairs or solitary, and was met with by Mr. Davison on Thatone plains and on the banks of the Attaran near Moulmein. This district appears to be the limit of its range in South-east Asia; and it has not been observed in China, or anywhere to the eastward of Burmah. In Upper India it is, I imagine, not uncommon, and extends in equal numbers through suitable places in Rajpootana to Sindh. In the Sambhur-Lake district Mr. Adam met with it in the hills near Nawa at Maha Pahar. It is not uncommon in Sindh, and also in Kattiawar, Guzerat, and Jodhpoor, wherever there is low scrub-jungle on sandy plains. Severtzoff remarks that it breeds in Turkestan in the south-east and throughout the north up to an altitude of 4000 feet; but in the more elevated region of Kashghar Dr. Scully did not meet with it. I have seen it from the Attrek river, on the eastern shores of the Caspian, and it is doubtless distributed throughout this region, much of which is suited to its habits. In Palestine, Canon Tristram met with it on the plains near Jericho and on the sand-dunes near Beersheba. In Asia Minor it is not uncommon in barren country. Mr. Danford obtained it in woods at Anascha, and got its eggs at Boghasli Khan in May. In Turkey it is considered by Messrs. Elwes and Buckley to be a summer visitor, as the climate is too cold for it in winter. It is abundant in Southern Russia, breeding in numbers near Odessa, and is not uncommon in Greece; whilst in the islands of Sicily, Malta, and Sardinia it is more or less resident. In parts of Italy it is likewise resident, as also in Spain, in the south of which country it is common, and affects barren plains and dry watercourses. Near Gibraltar it is, writes Col. Irby, resident in considerable numbers; Lord Lilford has seen it at Madrid, and Mr. Saunders at Malaga. It is very rare in Transylvania, having occurred at Alvinez, on the Maros river, and in the Hatzeg valley. As regards Central Europe, it is not uncommon in some parts of Germany and rare in others, and is said not to have been noticed in Upper Silesia, though it breeds in other parts of the province. Its northerly limit is Denmark, as it has not been recorded from Scandinavia or Northern Russia. It is a summer visitant to England; and has been known to breed, according to Mr. Moore, in the counties of Dorset, Hants, Sussex, Kent, Herts, Oxford, Bucks, Suffolk, Norfolk, Cambridge, Worcester, Lincoln, Rutland, Nottingham, and Yorkshire; but it is rapidly decreasing in these localities. In France, writes Mr. Dresser, it is more abundant in the south than in the north, being principally found on passage in the latter. In Holland and Belgium it is likewise a bird of passage. Passing over Spain to the continent of Africa we find Col. Irby recording it as common in Morocco near the Straits. Mr. Gurney met with it at Laghouat in Algeria, and it has been observed on the borders of the Sahara desert. Throughout Egypt and Nubia, writes Captain Shelley, it is found in pairs and families where there are desert places in the neighbourhood of small bushes. In the same regions Von Heuglin met with it, and also in Kordofan and Abyssinia, from which latter country Mr. Blanford records it too; in the Somauli country Von Heuglin believes he saw it. How far south it is resident he cannot say; but he found it sedentary in the Assouan district, and along the shores of the Red Sea he observed it now and then. In the Somauli country its place is taken by *Æ. affinis*, Rüpp., a near ally of the Cape species, *Æ. capensis*, Licht. The present bird is doubtfully recorded by Von Heuglin from West Africa; but in all the Canary Islands it is found, and near Port Orotava, in Teneriffe, Godman met with it in abundance. It is said by Mr. Vernon Harcourt to be a straggler to Madeira.

Habits.—This well-known bird confines itself, in Ceylon, to sandy places which are dotted pretty thickly with shrubs, or to dry marsh-land where there are clumps of bushes either scattered here and there, or lining the borders of creeks intersecting it. In such a locality near the so-called Salt Lake at Trincomalie two or

three birds were generally to be found ; but so watchful were they, that on hearing one's footsteps a long way off or seeing the approach of any one from a distance they would take to their heels, and dodging adroitly round the bushes would squat down in some sequestered nook where it was almost impossible to find them. When they are surprised they run swiftly for a yard or two and then get up, flying over the bushes and suddenly dropping, when they will run with all speed, and cannot again be flushed without a dog ; or they will squat on the ground resting on their tarsi, and so endeavour to avoid observation. From this habit they are called by the natives "Jungle-Hare." Indeed the habits of both this and the next species are not those of Plovers, but resemble more those of the Bustards, to which family they are allied as regards their anatomy. It is very fond of the cinnamon-gardens on the west coast, as these bushy places are exactly suited to its tastes ; and I have seen it even in the cultivated cinnamon at the back of the bungalows of Colpetty. In India it is often found among stony low hills, or in cleared spots in the jungle ; and it is, according to Jerdon, a favourite quarry for the *Shikra* with the natives. It is nocturnal as regards feeding, and subsists on grasshoppers, Mantidæ, flies, bugs (*Hemiptera*), and so forth. It has been noticed to run quickly to and fro among grass, snapping off the insects from the blades as it proceeded. It has a wild loud cry, not so musical or so high in tone as that of the next species, nor does it consist of so many syllables. I have never heard it in the daytime, except on one occasion, when I met with a pair which evidently had a nest in an island on the Batticaloa Lake, and which were very noisy, uttering loud cries even before I landed in their domain.

In Egypt the "Stone-Curlew" contracts, according to Von Heuglin, rather abnormal habits. He notes that, elsewhere so shy, it has there, to some degree, taken up with human beings, and runs about, often in considerable numbers, on the flat roofs of mosques, manufactories, barracks, fortifications, tombs, and dilapidated houses, even breeding among them, and that it is also to be seen among ruins, graveyards, and rubbish-heaps. This is a noteworthy instance of the manner in which local circumstances often affect the habits of a species. A more unlikely place to find this skulking Plover than the roof of a mosque can scarcely be imagined.

The flesh of this bird is excellent eating. The young, according to some observers, appear to be helpless and unable to run until quite fledged ; but this apparent incapability must be merely the result of an inherent habit of crouching to escape observation. Captain Marshall mentions finding a young bird, which was nearly fledged and able to walk about, squatting on the nest, allowing him to catch it without moving. In White's 'History of Selborne' we read that the young run immediately from the eggs, and are "withdrawn to some flinty field by the dam, where they skulk among the stones, which are their best security ; for their feathers are so exactly of the colour of our grey spotted flints that the most exact observer, unless he catches the eye of the young bird, may be eluded."

Nidification.—The breeding-time of this species in Ceylon is, I think, the months of July and August on the east coast ; but I did not succeed in finding their eggs when I met with the pair above spoken of. In India the majority, says Mr. Hume, lay in April, but eggs may be found from February till August. Concerning its nidification he writes as follows :—"According to my experience in Upper India, the place of all others in which they love to breed is some huge old mango-tree in which the trees are not very thick, surrounded by a good high mud bank, and of which the grass is strictly preserved by some native gentleman for the use of his cattle towards the close of the hot weather, when all other grass has disappeared. In such a grove I found thirteen nests, and saw at least fifty birds, many of which had not apparently yet lain. The nest is a mere hollow scooped out by the birds, very often in the midst of a layer of dead leaves, generally quite unlined, occasionally with a few blades of grass doing duty as lining. If the nest is out in an open place it is generally more or less concealed at the base of some bush or tuft of grass ; but if in a grove it is generally not far from some large root of one of the mango-trees in the midst of dead leaves, and these so harmonize with the colour of the eggs that no further concealment is necessary. A dozen times I have passed over, all but treading on eggs thus placed, and which I was eagerly looking for. Two is the ordinary number of eggs laid, but I have found three in a nest half a dozen times. I should guess that in about one in ten nests three eggs occur."

The eggs of the "Thicknee" are very large for the size of the bird. Some are almost perfect ovals in shape, while others are longer and more pointed at the small end. They are yellowish stone-colour, some with a grey hue and others with a brown. The markings are streaky or irregular angular blotches and clouds

of olive-brown mixed up with lighter streaks and strokes of a brownish straw-colour overlying smaller marks of bluish grey. In some the markings are much more linear than in others, and are collected round the centre of the egg. Some examples in the series before me measure 1·96 by 1·48 inch; 2·23 by 1·47; 2·04 by 1·48.

Mr. Hume, writing of an Indian series, says that they are smaller than English specimens; he finds the ground-colour invariably yellowish white, buffy yellow, or pale buffy brown. One egg is greenish white, with only a few brown specks on it; another is stone-colour, with enormous map-like blotches or clouds on the "broad half." In length they vary from 1·65 to 2·15 inches, and in breadth from 1·3 to 1·5 inch.

Genus ESACUS.

Bill stout and long, suddenly widened at the base; culmen straight as far as a point exactly above the gonys, where it is gently recurved to the tip; gonys deeply angulated and ascending; gape angulated; commissure straight from the gape-angle and then recurved. Nostrils linear, wide, and placed in a capacious depression. Wings long, pointed; the 2nd quill the longest, and the 3rd longer than the 1st; tertials exceeding the primaries. Tail rather short, of 12 feathers, round at the tip. Legs long; tibia bare much above the knee, which is enlarged. Tarsus nearly twice as long as the middle toe, reticulate in front and behind; toes stout, the basal membrane well developed; hind toe wanting.

Head and eye large.

ESACUS RECURVIROSTRIS.

(THE GREAT STONE-PLOVER.)

Edicnemus recurvirostris, Cuv. Règ. An. i. p. 500, note (1829); Jerdon, Madr. Journ. 1840, xii. p. 215.

Carvanica grisea, Hodgson, J. A. S. B. 1836, v. p. 776.

Esacus recurvirostris (Cuv.), Blyth, Cat. B. Mus. A. S. B. p. 260 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Jerdon, B. of Ind. iii. p. 652 (1864); Beavan, Ibis, 1868, p. 391; Holdsworth, P. Z. S. 1872, p. 472; Hume, Str. Feath. 1873, p. 232; id. Nests and Eggs, iii. p. 579 (1875); id. Str. Feath. 1875, p. 182; Ball, *t. c.* p. 294; Legge, Ibis, 1875, p. 401; Butler & Hume, Str. Feath. 1876, p. 14; Hume & Davison, *ibid.* 1878 (B. of Tenass.), p. 458; Davidson & Wenden, *ibid.* 1878, vii. p. 88; Ball, *t. c.* p. 227; Cripps, *t. c.* p. 301; Hume, *ibid.* 1879, viii. p. 112 (List Ind. B.).

Curved-billed Bustard; *Bastard Florikin*; *Curved-billed Plover* of some. *Burra Karwanak*, Hind.; *Abi*, of Hindoo Falconers; *Gang titai*, lit. "Ganges Lapwing," Bengal. (Jerdon); *Mosul-Krandi*, *Mosul-Kanati*, lit. "Hare-eyed" (Layard).

Adult male (Ceylon). Length 20·0 inches; wing 10·5 to 10·7; tail 4·75; tarsus 3·2; middle toe and claw 2·0; bill to gape 3·4 to 3·5.

Female (Ceylon). Length 21·5 inches; wing 10·7 to 10·9; tarsus 3·5; middle toe and claw 2·3; bill to gape 3·6 to 3·7.

Iris pale golden, marked with brown radii or pencillings; eyelid and orbital skin yellowish; bill black, with the base of upper mandible to the nostril, and that of lower to the gonys, yellow; legs and feet pale yellowish green, the toes washed with brown, and the soles and posterior part of knees bluish.

Head, hind neck, back, scapulars and rump, basal portion of tail, as also the coverts along the ulna, pale cinereous brown, the feathers on the upper parts with dark shafts, and the head and nape darker than the rest; forehead and along past the gape, lower part of cheeks, throat, a circle round the eye, continued as a broad streak down to the nape, and under surface white: the throat washed with pale cinereous grey, and the feathers there with darkish shafts; a streak beneath the gape and a border round the white orbital region, expanding over the ear-coverts and blending into the brown of the neck, black; primaries, secondaries, a band formed by the tips of the lesser coverts, and the terminal portion of tail brownish black; basal part of inner edge of quills, a bar across the first three primaries (on the outer web of the 1st only), the three inner primaries (with the exception of the centre part), and a band across the tail white; beneath the brown wing-band a line of white formed by the bases of the next row of feathers.

Immature birds have the feathers of the upper part of the back, the scapulars, and the lesser wing-coverts tipped with greyish; and those of the dark wing-band edged with fulvous-brown.

Obs. Indian examples which I have examined do not differ from Ceylonese. A specimen from Bhotan is identical with one of my own—wing 10·7 inches. Dimensions of Indian birds, as recorded in 'Stray Feathers,' are:—♂ (Sindh), length 21·0 inches, wing 10·5, expanse 36·5, tail 5·5, tarsus 3·4, bill at front 3·0, weight 1 lb. 12 oz. (Hume); ♂ (Furreedpore), length 20·0, wing 10·25, tail 4·5, tarsus 3·42, bill from gape 3·42 (Cripps).

Esacus magnirostris, Geoffr., is the Austro-Malayan representative of the present bird, and has recently been found in the Andaman Islands. It is a larger, darker, and more massive-billed form of the Indian bird. In plumage it differs in having the head and face much darker; the sides of the crown and nape, cheeks, and ear-coverts blackish brown, and the top of the head deeper brown than in the present bird; the winglet and the lesser wing-coverts are dark brown, and the white wing-bar succeeds the latter part; the upper part of the throat is white and the lower dusky, with the feathers striated. An Australian specimen in the national collection measures 2·7 inches

in the bill at front, which is less than in some specimens of the smaller Indian bird; but the bill is very stout and broad, measuring 0·75 inch in height at the base; wing 10·6. The dimensions of an Andaman example (male) are given by Mr. Hume as follows:—length 22·5 inches; wing 11·0; tarsus 3·5; bill at front 3·1.

Distribution.—This large Plover is a locally distributed bird in Ceylon, occurring all round the coast from Chilaw and Puttalam northwards to Jaffna, and thence down the east coast to Trincomalie. Along this line of sea-board it may be found here and there as isolated individuals or two or three together; but it is nowhere numerous. I have seen it on Karativoc Island, at Aripu, Manaar, on the Erinativoe Islands, and in many places on the Jaffna peninsula, including the vicinity of Elephant Pass. About Trincomalie it is a resident species, and extends inland to Kandelay tank. At other large sheets of water I have not seen it; and in Ceylon it is not diffused along the river-beds, as in India, but is almost entirely a littoral species. Southward of Trincomalie I have seen it near tanks down to the Virgel, and also met with it between that river and Batticaloa. It probably occurs in the neighbourhood of this latter place, and thence down the coast to Yāla, between which and Hambantota it is not uncommon. I have seen it there in March and in July, so that it must be resident there as in the north. On the south-west I have never known it to occur. Layard was under the impression that it was migratory, and states that he has seen it coming from the seaward in the month of December. It is probable, therefore, that there may be a partial migration from the coast of India at that time; but as it breeds freely in the island, it is unquestionably, to a great extent, resident in it. Mr. Holdsworth has seen it in August at Aripu, and I have observed it all through the year at Trincomalie, although during the breeding-season it used to leave its wonted haunts about the harbour, and retire to secluded sand hills and waste places to breed.

In India it is apparently distributed here and there throughout the country, occurring only as a straggler beyond Burmah; and it seems to be more abundant in Central India along the valley of the Ganges, say between the division of Chota Nagpur and the Delhi district, than elsewhere. In the Deccan it is said to be “not uncommon” (*Davidson*). In Chota Nagpur Mr. Ball records it from the Koel river and the rocky beds of the Mahanadi and Ebe, in the Sambalpur district, and says it is particularly common on the Brahmini river in Orissa; he likewise records it from the Godaveri valley. About Calcutta it is rare, not more than a dozen specimens on the average being seen in the market in one season. Further east in Furreedpore it is rare, according to Mr. Cripps. How far to the north in this direction it extends I do not know; but there is a specimen from Bhotan in the British Museum. On the Burmah rivers Blyth stated it to be common (*Ibis*, 1867, p. 165); but I find but little record of its occurrence in that country of late years. Captain Feilden procured it on the Irrawaddy at Thayetmyo; but Dr. Armstrong did not meet with it on the Delta. It is rare in Tenasserim, where Mr. Davison met with it on the Hounghthraw and Attaran rivers, and observes that it is only occasionally seen there in pairs or in small parties. In the Andamans it is replaced by the Australian species. It is found along the sandy beds of rivers in the North-west Provinces, and extends into the Punjab, where Mr. Hume says that it is found on all the great rivers, as also in Sindh on the Indus. Captain Butler writes that in Northern Guzerat it is rare; he procured a pair on a gravelly island in the bed of a river between Ahmedabad and Deesa, and met with it once or twice elsewhere. It is also found, but rarely, in Kattiawar, Cutch, and Jodhpore. It is doubtful, observes Captain Butler, whether it is migratory or not to Guzerat. Hodgson was under the impression that this bird migrated to Thibet in winter; but I find no recent record of its occurrence beyond the Himalayas; and the specimens he procured in Nepal were in all probability following up the beds of the rivers for the purpose of breeding.

Habits.—Both this and the last genus differ from true members of the great Plover family in their nocturnal habits, for which their large eyes, which form such a marked characteristic, are eminently adapted. In Ceylon, where the majority of the rivers, whose beds are half-dry during a great portion of the year, chiefly flow through thick jungle, the Great Stone-Plover finds no congenial home on their banks; and it consequently differs in its habits from its fellows in India by frequenting the sea-shore, rocky islets in harbours, the sandy, gravelly borders of tanks, or backwaters near the sea, and such like. They are very local, taking up their quarters in one spot, particularly a rocky or shingly islet, for many months at a time; and so quiet are they in the day-time that, though their quarters may be close to a public resort, they are scarcely ever seen or heard until

sundown, when they sally off to feed, uttering their singular musical whistle as they fly about in the fast-fading twilight. A pair frequented the little island close to the entrance to the Trineomalie fort, and in the evening gave signs of their presence by flying over the esplanade backwards and forwards to the sands in Baek Bay, frequently whistling as they crossed and recrossed the ground. On moonlight nights they were to be heard all night long, as they wandered here and there, startling the stillness of the night with their *krēēē*, *krēēē—krēē*, *krēkrēkrēkrē*, the first syllables being long drawn and the last gradually increasing in speed until the note ceased. They are wary birds both by day and night, but they will allow a boat to approach quite close sometimes before taking flight. They fly in a straight and even course, taking short quick strokes of the pinions. They subsist on crabs and mollusca, as well as insects, and feed almost entirely at night, for I have shot examples in the afternoon with their stomachs perfectly empty. An individual which was winged from my canoe off Gunpowder Island, Trineomalie, when I commenced to pursue it took to the water, swimming well, and when approached uttered loud creaking cries of alarm, and dived freely, making its way along beneath the surface with ease.

In India, as above remarked, they confine themselves to the beds of rivers, especially, writes Mr. Hume, those in which rocky or stony banks or islands crop up.

Nidification.—This species, I am informed by Mr. G. Simpson, of the Indian Telegraph Department, breeds in the island of Manaar in February. In the following month I found it nesting in the Jaffna peninsula near Pootoor and at Aripu. I was unable to find its eggs at either place, and imagine, from the anxious manner in which the birds flew round me, uttering their piping whistle, that they had young. A pair of eggs were sent to me in March 1877, just before leaving the island, which were taken in the shingly island in the Kanthelai tank. They were found, I believe, in a depression in the sand and gravel not far from the water's edge. One is oval in shape, and the other a rather broad, somewhat pointed oval. The ground-colour is greenish drab: one is openly clouded with longitudinal patches of several shades of blackish sepia, overlying inky-grey smears and blotches, some of the dark markings being of a linear shape; the other, which is slightly paler in colour, is rather closely marked with longitudinal washed-out blotches of the same colour, intermingled with streaky scribbings, spottings, and irregular tracings of the same hue, all of which are pretty evenly distributed over the entire surface of the egg. They measure 2.25 by 1.7 and 2.19 by 1.71 inch.

In India the Curved-billed Plover breeds in river-beds where there are banks of sand and shingle or "outerops of rocks mingled with patches of sand." Captain Marshall, however, once found the nest in a ploughed field in the Sharunpoor district, three quarters of a mile from the nearest water. The nesting-season lasts from March until June. On the Jumna, where Mr. Hume took many eggs, they were deposited in shallow depressions in the sand in places surrounded by rocks, and sometimes beneath edges of the same. The eggs, which are two in number, vary, he remarks, from a pale cream-colour, through an earthy drab-colour, to a somewhat pale olive-brown, the markings consisting of "all possible combinations of blotches, streaks, lines, &c. (in some cases thickly sown over the whole egg, in others sparsely distributed) of every shade of olive and umber-brown, in some becoming almost black." The average of twenty eggs is said to be 2.15 by 1.6 inch, the largest measuring 2.32 by 1.7. Mr. Anderson has known a wounded bird remove the eggs she had been sitting on before being fired at.

GRALLÆ.

ŒDICNEMIDÆ.

Subfam. CURSORINÆ*.

Bill somewhat slender and curved or straight. Legs slender; knees slightly enlarged. Tarsi shielded with stout transverse scutes before and behind. Toes short and slightly webbed. Stomach large and membranous.

Genus CURSORIUS.

Bill wide at the base, curved throughout, the tip bent; nostrils oval and basal, placed in a depression. Wings moderate, the 2nd quill equal to or slightly longer than the 1st; tertials nearly as long as the primaries. Tail short and rounded. Tarsus and bare tibia covered with transverse scutes before and behind; knees thick; toes very short, the middle toe much longer than the lateral ones, united to the outer at the base by a web, and also to the inner by a very small one; claws short and straight, the middle one pectinated.

CURSORIUS COROMANDELICUS.

(THE INDIAN COURIER.)

Charadrius coromandelicus, Gmel. Syst. Nat. i. p. 692 (1788).

Cursorius asiaticus, Lath. Ind. Orn. ii. p. 751 (1790).

Cursorius coromandelicus (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 259 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Jerdon, B. of Ind. iii. p. 626 (1864); Beavan, Ibis, 1868, p. 388; Holdsw. P. Z. S. 1872, p. 470; Adam, Str. Feath. 1873, p. 393; Hume, *t. c.* p. 421; Ball, *ibid.* 1874, p. 429; Parker, *ibid.* 1875, p. 267; Hume, Nests and Eggs, iii. p. 564 (1875); Butler & Hume, Str. Feath. 1876, p. 10; Fairbank, *t. c.* p. 262; Davidson & Wenden, *ibid.* 1878, vii. p. 87; Ball, *t. c.* p. 226; Hume, *ibid.* 1879 (List B. of Ind.), p. 111.

Coure-vite de Coromandel, Buffon, Pl. Enl. 892; *Coromandel Plover*, Latham; *The Indian Courser*, *The Indian Courier-Plover*. *Nukri*, Hind.; *Yerra chitawa*, Telugu.

Adult male and female (Ceylon). Length 8·8 to 9·5 inches; wing 5·8 to 6·1; tail 2·3 to 2·5; tarsus 1·95 to 2·15; bare tibia 0·85 to 1·0; middle toe and claw 0·95 to 1·05; outer toe and claw 0·55; bill to gape 1·1 to 1·2. Females as observed by me average larger than males.

Iris dark brown; bill blackish; gape and base of lower mandible yellowish; legs and feet yellowish white or whitish, joints dark, claws black.

* The Courier-Plovers resemble the Stone-Plovers in their anatomy, both showing affinity to the Bustards in this respect; in many of their habits the two groups are alike. The remarkable Double-banded Plover, *Rhinoptilus bitorquatus*, Jerd., is, in the matter of the bill, to a slight extent a link between *Cursorius* and *Œdicnemus*.

Forehead and crown rich deep rufous; the occiput jet-black, running to a point, and partly concealed by the overlying rufous feathers; a broad, velvety, white supercilium running back round the black occiput, and likewise ending in a point; a broad black band from the nostril through the eye bounding the white stripe all round; chin, face, and gorge white, passing into the pale fulvous rufous of the ear-coverts, neck, throat, and chest, the latter darkening on the centre of the breast into deep rufous; lower part of hind neck, back, rump, wing-coverts, tertials, most of the tail, sides of breast, flanks, and secondary under wing-coverts quaker-brown; primaries and their coverts above and beneath, a subterminal band on the tail, and the centre of the belly black; abdomen, under tail-coverts, sides of the rump, tips of upper tail-coverts, lateral tail-feathers, and tips of the remainder, decreasing towards the centre, white.

The black markings of the tail vary (probably the result of immaturity) in birds otherwise plumaged alike, some examples having the black bar present on the central feathers and the inner web of the laterals.

Females have the rufous of the head and black of the abdomen paler than males. I am unable to state whether this character is constant; but it is observable in two specimens I have examined from Ceylon.

Young. An immature bird from the Punjab measures 5·7 inches in the wing, and has the forehead paler, inclining to fulvous; the chest is likewise of a paler hue than in adults; the feathers extending from the shoulder along the bend of the wing to the point are dark brown, edged with rufescent buff; and some of the median coverts overlying the tertials have whitish marginal patches as well as tips; the subterminal patches of the tail-feathers are brown instead of black, and the under wing is blackish brown instead of black.

Obs. Indian specimens in the national collection correspond in the tints of their plumage with Ceylonese. A small series measure as follows:—wing 5·9 to 6·0 inches, tarsus 2·1 to 2·2.

Captain Beavan's measurements of four examples shot at Umballah and Morar are as follows:—Length 8·7 to 9·3 inches; wing 5·3 to 6·1; tail 2·25 to 2·37; tarsus 1·93 to 2·25; bill from gape 1·18 to 1·25.

The European representative of this handsome Courser is *C. galliens*; it inhabits the southern parts of that continent, Northern Africa, and extends through Western Asia to Sindh and Rajpootana. It is called the Cream-coloured Courser, and is larger in the bill and stouter in the leg than our bird. The upper surface is a warm creamy fawn-colour, reddest on the tail, forehead, and crown; the nape is ashy, with an underlying black patch, under which a white stripe passes from above the eye, bounded beneath by a black band, which, however, does not pass through the eye; wings black, secondaries tipped with white; beneath delicate greyish fawn-colour, paling to white on the lower parts; under wing black. Wing of a Sambhur-Lake specimen before me 6·1 inches; tail 2·7; tarsus 2·0; bill to gape 1·4.

It is interesting to note that the South-African species, *C. burchelli*, Swains., is, in a manner, a representative of our bird, possessing the same type of coloration. The upper surface is rufous sandy brown, the front part of the head and the sides of the hind neck chestnut; but the occiput is *ashy grey*; the black nape and underlying white and black stripes are much as in our species; the breast is pallid rusty brown, set off against the white abdomen by a black border. It is a smaller bird than the Indian. A Natal specimen measures 5·2 inches in the wing.

The remarkable Double-banded Plover, *Rhinoptilus bitorquatus*, Jerd., belongs to this family, but has a stouter and straighter bill, and appears to be restricted to a very limited area near the Eastern Ghâts.

Distribution.—This interesting bird has a very limited range in Ceylon, being confined to the Jaffna peninsula and the north-west coast (including the island of Manaar) as far south as Pomp-Aripu. Beyond this place I do not think it extends, as the large tract of jungle between there and Puttalam seems to present a barrier to its further wanderings towards the south.

Layard speaks of finding it on the Wally plains in the month of April; and Mr. Holdsworth saw it in almost every month in the year about Aripu, though it was more numerous in the winter season than at other times. I did not meet with it on the Jaffna plains, but found it on open land along the west coast to the north of Mantotte, and also met with it in the island of Manaar; it was, however, more numerous about Aripu than anywhere else. Mr. Simpson, who resides in Manaar, has seen it on the coast-plains along the sea-board from there up to Pooneryn; but he tells me that it is never met with inland. I do not think that there is any migration from India to Ceylon during the cool season, but that the birds merely assemble together in favourable localities from the surrounding districts.

In India it would appear to inhabit the northern parts of the peninsula more than the southern; but it

does not seem to extend into the far north-west, where it is replaced by the Cream-coloured Courser. Captain Butler writes that it is common all over the plains of Guzerat in the cold weather, being apparently migratory, as it is not found there during the hot weather. It does not occur in the northern parts of Sindh, according to Mr. Hume, nor in the greater portion of Jodhpoor; but has been recorded from the east of Sindh by Messrs. James and Doig. It is rare in Cutch. About the Sambhur Lake it is, says Mr. Adam, very abundant in the cold season, and associates with *C. gallicus*. Captain Beavan procured it near Umballah in the month of November, and states that it is commoner a month later at Morar. Mr. Ball writes of it as "common on the plains of Sirguja," and as also frequenting the Main Pât, a plateau of about 3600 feet elevation; nor is it rare, he says, in Birblum, to the north of Suri. He records it also in the same direction from Hazaribagh, also from Lohardugga, Bilaspur, Sambalpur, and Orissa, north of the Mahanadi; likewise from Raipur, Nowargarh, Karial, and the Godaveri valley. In the Deccan it is, according to Mr. Fairbank, common in the cold season, and also occurs in July, while Messrs. Davidson and Wenden say that it breeds there. I have no data as to its occurrence in the extreme south; but I conclude that it inhabits the plains and open country in the Carnatic, although Jerdon states that it is unknown on the Malabar coast.

Habits.—In Ceylon the Indian Courser frequents bare pasturage, sandy plains dotted with herbage and bushes, dried-up paddy-fields near the sea-shore, and so forth. In India it is to be found both in the interior and near the sea, frequenting, as Jerdon remarks, "the barest plains and ploughed fields." In its actions and deportment it resembles the Bustards, or still more the Collared Plain-Wanderer of Australia, *Pedionomus torquatus*, Gould. Associating in little troops, the members of which keep some little distance apart from one another, it runs hither and thither, taking a few not *very* rapid strides, suddenly stopping and advancing or retiring in a new direction; and when it checks itself in its progress it stretches up its head, which at all times is carried very erect, as if to take a better view of its position. It does not appear to see well with the horizontal rays of the sun in its eyes, as I found no difficulty in approaching it at sunrise under these conditions. When shot at while standing and mortally wounded, I noticed that it flew a little distance as if unhurt, and remained erect until it suddenly fell to the ground dead; others would squat on the soil when their companions were fired at, as if to hide themselves. It flies with a rolling movement, something like the Roller, taking rather slow flaps, and sometimes it mounts high in the air and descends to the ground with outstretched wings.

Mr. Holdsworth remarks of it:—"Its flight is heavy and flapping, like that of the Lapwings; but it runs lightly and fast; and when separated from its companions, I have more than once seen it running along behind the bund of a dry paddy-field, with head lowered and wings trailing on the ground, presenting a most curious appearance, as the colour of the back resembled that of the dry mud, and there was nothing to attract attention but the drooping black primaries."

Jerdon writes that it nods the head when it stops running; and Burgess states that it has the "habit of running for a distance at speed, suddenly stopping, erecting the body, and then starting off again." The fact is that it rapidly covers the ground owing to the length of its stride, and not to the speed of its movements. If its strides were, for instance, as rapid as those of many of our small Waders (Stints, &c.) it would move exceedingly fast. Its food consists of grasshoppers, Coleoptera, and various insects; the stomachs of some I shot at Aripu were filled with a large, flat, tick-like insect.

Nidification.—I was informed by natives on the north-west coast that this bird breeds there in the early part of the year; but I am not prepared to verify the statement, and am inclined to think it lays later on in the year.

In India it is stated to lay, as a rule, from March until July; of its nesting Mr. Hume writes:—"It scrapes a slight hollow in the ground, at times on a bare plain, oftener, I believe, under some tuft of grass or low bush, in stunted, straggling, dry upland jungle, and in it lays two or three eggs on the bare earth. I have never seen any lining, nor have I known of more than three eggs being found." The eggs are described as "very spherical and glossless; the ground-colour is a yellowish stone-colour or fawn-white, and they are closely mottled, spotted, and in some specimens lined all over with dull blackish brown and pale inky purple." They average in size 1.19 by 0.97 inch.

GRALLÆ.

Fam. GLAREOLIDÆ*.

Bill short, curved, the gape very wide, and the tip compressed. Wings very long. Tail short, either forked or even, of 12 feathers. Legs moderately long. Toes short; hind toe well developed.

Neck short. Of Swallow-like form. Of crepuscular habit. Sternum with a double emargination.

Genus GLAREOLA.

Bill short, the culmen somewhat compressed at the base, then slightly elevated and curved to the tip; gape very wide and receding; nostril oval and capacious. Wings very long, exceeding the tail, pointed; the 1st primary the longest, slightly exceeding the 2nd; tail broad, emarginate or forked. Tarsus slender, much longer than the middle toe, reticulated in front; tibia bare for the length of the hind toe and claw. Lateral toes very short and subequal, the outer slightly syndactyle; claws straight, the middle one slightly pectinated; hind toe elevated.

GLAREOLA ORIENTALIS.

(THE EASTERN SWALLOW-PLOVER.)

Glareola orientalis, Leach, Trans. Z. S. xiii. p. 132, pl. 13. figs. 1, 2 (1821); Kelaart, Pro-dromus, Cat. p. 132 (1852); Gould, B. of Austr. vi. pl. 23 (1848); Blyth, Cat. B. Mus. A. S. B. p. 259 (1849); Jerdon, B. of Ind. iii. p. 631 (1864); Gould, Handb. B. of Austr. ii. p. 245 (1865); Swinhoe, P. Z. S. 1871, p. 403; Ball, Str. Feath. 1873, p. 83; Hume, ibid. 1874, p. 284; Salvadori, Ucc. di Born. p. 319 (1874); Legge, Str. Feath. 1875, p. 371 (first *authenticated* record from Ceylon); Hume, Nests and Eggs, iii. p. 568 (1875); Hume & Davison, Str. Feath. 1878 (B. of Tenass.), p. 455; Oates, ibid. 1878, vii. p. 49; Davidson & Wenden, *t. c.* p. 88; Hume, ibid. 1879, viii. p. 69, et p. 112 (List Ind. B.).
The Oriental Pratincole, Latham; *Oriental Glareole*, *Larger Pratincole* of some.

Adult male and female. Length 8·8 to 9·3 inches (outer tail-feathers variable in length); wing 7·4 to 7·5; tail 3·0 to 3·2, depth of fork 1·0; tarsus 1·3 to 1·4; bare tibia 0·5; middle toe and claw 1·0 to 1·05; hind toe and claw 0·25 to 0·3; bill to gape 0·97 to 1·03; expanse (of one with wing of 7·5) 22·0.

Iris dark brown; bill black, the gape brownish, and the base of lower mandible and margin of upper, from gape to nostril, red; tarsi reddish brown, changing to plumbeous on the feet and tibia.

Head, upper surface, wings, sides of neck, and the chest brown, palest on the latter, and with a green lustre above, strongest on the scapulars; forehead and above the lores slightly darker; chin, cheeks round the gape, and throat buff, bounded all round by a black border, with a white inner edge, passing up to the anterior corner of the eye;

* The true position of these remarkable birds has been the subject of much discussion. They differ from the rest of the Grallæ in their *Hirundine* or Swallow-like aspect and habits, and in their crepuscular disposition recall the Nightjars somewhat. In their anatomy, wing- and leg-structure, general mode of life, and in their nidification they are strictly a Plover form.

a white orbital fringe; quills and terminal portion of tail (deepest on the centre) blackish brown, illumined with green on the latter part; 1st primary-shaft white; breast pale rufous or tawny, blending into the brownish of the chest, which changes into the white of the lower parts, basal portion of tail, and upper tail-coverts; axillary plume and secondary under wing-coverts, which are much elongated, dark chestnut; primary under-coverts blackish brown; edges of feathers beneath the metacarpus white.

Young. The chick is a "mixed pepper-and-salt colour, the black preponderating" (Oates).

Birds of the year have the wing about 7.2 inches; bill, with the base of the under mandible and the margin of the upper at the gape not so red as in the adult.

The brown of the head and upper surface paler and margined with fulvous, the hind neck much pervaded with the latter, the buff of the throat not so pure as in the adult, and the feathers tipped with black, forming striae, except at the chin; the black border is not clearly defined, and the white inner edge not distinct; chest a darker brown, and the feathers edged fulvous; breast less rufous, and the colour more confined to the centre, the sides being dusky; the outer under wing-coverts are edged with black, instead of being entirely chestnut. With age the black points on the buff throat disappear, but the gorget and white inner edge do not become clearly defined until the bird is matured; the chest loses its pale edgings, and the under wing-coverts become richer.

Obs. Ceylon specimens of this interesting species correspond well with Indian and continental birds. A Bangkok specimen, however, has the secondaries slightly tipped with white, though it corresponds in other respects with examples from Ceylon: it measures 7.5 inches in the wing; fork of tail 1.0.

G. orientalis differs from the European species (*G. pratincola*) in its less forked tail and in the absence of white tipping to the secondaries and paler head, besides which it is a smaller bird. In the latter the head is concolorous with the back, and has a sandy hue on the nape and hind neck. Four specimens from Africa and Southern Europe measure in the wing 7.5, 7.5, 7.6, 7.8 inches respectively; the depth of the fork of the tail varies from 2.0 to 2.3.

Glareola nordmanni, a Central-Asiatic species, has black axillaries and under wing-coverts, like *G. lactea*, is very similar on the upper surface to the two foregoing, but differs beneath in being greyish white from the chest downwards; the chest is light brown, and the throat paler than in the Indian bird; the secondaries, like it, want the pale tipping. Wing 7.5 inches.

G. grallaria, Temm., from Australia and some of the Malay islands, is characterized by its large size, square tail, and long legs. A Bouru example measures 8.0 inches in the wing, tail 2.5, tarsus 1.9. The under wing is black, and the flanks deep maroon.

Distribution.—As yet this fine Swallow-Plover has been found in very few localities in Ceylon. Kelaart includes it in his list, but from what district it is not stated, and subsequent observers seem to have passed it over. I met with it, for the first time that it was ever satisfactorily identified in the island, at Minery tank, on the 10th of July, 1875; and the first example shot was a female in a state of breeding. In the following month it was found in considerable numbers on the western shores of Kanthelai tank, accompanied by young, which had evidently been reared in that spot. I conclude that it breeds yearly about the grassy lands surrounding these large sheets of water; and probably some remain there throughout the year while their companions depart for other spots suitable to their habits in unfrequented portions of the island. That it wanders about is proved by the fact of an example having been procured on the Galle face, Colombo, by Mr. MacVicar, since my departure from the island. The specimen in question was observed by this gentleman flying about the beach on the 10th of September, 1876, and is now in the Colombo Museum.

I will not undertake to assert, however, that it is a permanent resident in Ceylon, as it is everywhere a bird of local and uncertain distribution; and it is possible that during the early part of 1875, at the time of bird-migration, large flocks may have gone south to Ceylon and remained there during the monsoon to breed.

By Jerdon it was said to be "found throughout India in suitable places, but chiefly in the cold weather;" but to this statement Mr. Hume takes exception, and writes in 1874 ('Stray Feath.' p. 285):—"My experience does not corroborate this" (Jerdon's) "view of the distribution of this species. I have never heard of this species occurring in Sindh, the Punjab, Rajpootana, or the Central Provinces, and it is of extreme rarity, as far as my experience goes, both in Oudh and the North-west Provinces; almost the only place in which I have known it to occur within these latter provinces has been along the Ganges from Futtehghurh downwards, and there only in small numbers and at comparatively rare intervals." Mr. Doig, however, has recently met with it in Sindh.

In the peninsula of India I find that Messrs. Davidson and Wenden record it from the Deccan, the former gentleman having met with it in the river Bhima during the cold season. As future observation renders the distribution of birds more thoroughly known, it will doubtless, from time to time, be found on the banks of various other rivers. Eastwards of the Bay it is a more common bird. Mr. Oates leads us to infer, in writing to Mr. Hume ('Nests and Eggs,' iii.), that it frequents the plains of Pegu in large numbers, and he subsequently found it breeding there. Further south, in Tenasserim, it is, according to Mr. Hume, "confined apparently to the cultivated and open lands of the central portions of the Province and the tracts west of the Sittang." Mr. Davison observes that it is not uncommon in the Malay peninsula; and the former gentleman cites Singapore as a locality in which it has been found. In the island of Penang, Mr. Wallace has obtained it; and on the Andamans and Nicobars it was occasionally met with by Mr. Hume and his party in 1873, though it is recorded as by no means plentiful. Southward of Singapore it ranges into Java, where it has been procured by Messrs. Leach and Horsfield; and though we have no record of its occurrence in Sumatra, it is, I think, evident that it must inhabit that island. It has been obtained by various naturalists in different parts of Borneo; beyond this island it extends through Timor to Australia, to which country, however, according to Mr. Gould, it can only be considered a rare visitant. In his 'Handbook' he refers to a pair in the collection of Mr. Alexander Macleay, of Sydney, which, it is presumed, were obtained in the northern regions, as subsequently Mr. Ramsay notes it from Port Darwin and Port Essington.

It has been procured at Bangkok, and doubtless it occurs at other places along the south-east coast of the continent to China, in which empire it is recorded by Swinhoe from Tientsin. It has likewise been observed in Formosa. It ranges into Mongolia, where, according to Przevalsky, the northern bend of the Hoang-ho forms its limit to the north. He observed it in pairs and small flocks in the valley of this river from the town of Baut as far as the western portion of Muni-ul.

Habits.—As a Ceylonese bird this fine Pratincole frequents grassy meadows surrounding large sheets of water, and appears to confine itself to particular spots, although at sunset it probably moves about a good deal. I found it on the north side of the Minery Lake and on the west side of Kanthelai tank; but at each of these sheets of water it had evidently selected the spots I found it in for the purpose of rearing its young. Its ordinary flight is regular, and performed with not very rapid strokes of its pinions, and in its character resembles that of the Terns; but when hawking for insects, it dashes about, rising and falling, and twisting and turning in a very Swallow-like manner. I first met with it under these circumstances, and was attracted by its nocturnal movements, or I should most likely have passed it over. The scene was eminently characteristic of the wild jungle-regions of Ceylon. I had just been witness to a grand aerial tournament between a splendid pair of Sea-Eagles, which were breeding among the large trees on the colossal retaining bund of the tank, and a Fish-Eagle (*Polioaetus ichthyaetus*), which had evidently been trespassing on the preserves of its majestic relations. After admiring the grand evolutions and swoops of these noble birds, I descended to the grassy plains on the borders of the lake. The place was swarming with animal life: hundreds of cattle were scattered here and there as far as the eye could discern them in the dusk; little groups of unsightly buffaloes, some tame and some wild, were standing on various little eminences on the shore; an endless stream of Cormorants were wending their way across the water to some distant roosting-place; and, with the same object in view, a small "mob" of Pelicans were leisurely flapping off to the surrounding forests, in which the deep bay of the Sambhur deer could be distinctly heard. Presently my eye caught sight of a bird, then new to me, which was flying about, like a Nightjar, in pursuit of the moths with which the still hot air was swarming. It was the only specimen I saw that evening, and I had considerable difficulty in persuading my native attendant to wade into the lake into which it fell and retrieve it, so alarmed was he of the crocodiles which infested the water.

At Kanthelai, when I invaded the breeding-grounds of those which were frequenting the meadows on the west side, they flew overhead, crossing and recrossing me in front, but did not pass behind me. They uttered a *churr*-like note, and also a call of alarm like the "crake" of some small Terns. They once or twice poised themselves in the air over my head, endeavouring to entice me away from their young. These birds were invariably flushed from the ground on which they were reposing, and in no case did I observe them hawking for insects during the heat of the day. They would appear to feed chiefly in the evening, and perhaps also at early morning. The food of those I shot consisted of moths, caterpillars, and beetles, chiefly the latter.

Jerdon, who refers to their crepuscular habits, remarks, "It is generally found near large rivers, occasionally in very large flocks, hawking over the fields of grain or runnahs of grass, catching insects in the air, and sometimes uttering its peculiar call when flying. Now and then small parties may be seen, long after sunset, flying round and round some small field or cultivated patch, pursuing moths or beetles, and now and then alighting on the ground. In the middle of the day it may be seen seated in large flocks at the edge of some tank, or on a sand bank in the river."

Mr. Davison records his observations of this species in Tenasserim as follows:—"It is, as a rule, shy and difficult to approach, and rises with a soft Plover-like note, *to wheet, to wheet*; they run rapidly, and when approached run some little distance before rising. . . . I have repeatedly seen them high up in the air, hawking white ants and other insects; their flight is then very rapid and graceful, and very Swallow-like."

The *nidification* of this interesting bird has only of late been made known, through the researches of Mr. Oates in Pegu. In writing to Mr. Hume ('Nests and Eggs,' iii. p. 568), though up to that time unsuccessful in finding its eggs in Pegu, he describes the birds, when their breeding-grounds were invaded, as squatting on the ground with expanded wings and outstretched necks, trying to look as fierce as possible. Subsequently he remarks:—"I have found the eggs of this species from the 16th of April to the 1st May, on which latter date some eggs were fresh, but others incubated. Three appears to be the maximum number of eggs, but only two are more frequently laid. The eggs are deposited on the bare ground, burnt-up sandy paddy-fields being much frequented. No great number of birds breed together, nor have I ever found two nests very close to each other; the finding of eggs is consequently very laborious work. When disturbed, the sitting bird flies round one's head for a short time, and then goes away; but when the young are lying hid, then the birds display great anxiety, and it is on these occasions that the bird squats on the ground with wings outspread and neck outstretched. I fancy this action is meant to counterfeit lameness, and so draw the intruder off the scent. " The eggs "are quite different from those of *G. lactea*. The ground is buff or stone-colour, and the whole shell is thickly blotched with blackish brown and underlying smears of paler brown sunk into the shell; other eggs are so thickly blotched as to appear black when viewed at a short distance off. They are without gloss and Plover-like; one end of the egg is much pointed. The average of a considerable series is 1.18 inch by 0.93." Mr. Doig, in his recent notes on this bird as observed on the Eastern Narra, Sindh, corroborates Mr. Oates's experience as to its stretching itself on the ground with expanded wings, but considers this habit is practised for purposes of concealment.

GLAREOLA LACTEA.

(THE SMALL SWALLOW-PLOVER.)

Glareola lactea, Temm. Pl. Col. pl. 399 (1838); Blyth, Cat. B. Mus. A. S. B. p. 259 (1849); Jerdon, B. of Ind. iii. p. 632 (1864); Hume, Str. Feath. 1873, p. 440; Legge, *t. c.* p. 490; Ball, *ibid.* 1874, p. 429; Hume, *ibid.* 1875, p. 179; Legge, *t. c.* p. 204; *id.* Ibis, 1875, p. 400; Hume, Nests and Eggs, iii. p. 568; Armstrong, Str. Feath. 1876, p. 338; Oates, *ibid.* 1877, p. 164; Hume & Davison, *ibid.* (B. of Tenass.), 1878, p. 454; Davidson & Wenden, *ibid.* viii. p. 88; Ball, *t. c.* p. 226; Cripps, *t. c.* p. 299; Hume, *ibid.* 1879 (List Ind. B.), p. 112.

Glareola orientalis (Leach), apud Jerdon, Cat. B. South India, Madr. Journ. xii. p. 215.

Glareola —?, Legge, Mem. Hamb. B. Ceylon, Blue-Book, 1873, p. 11.

Glareole lacté, Temminck; *Lesser Pratincole* of some.

Adult male and female. Length 6·5 to 6·8 inches; wing 5·7 to 6·05; tail 2·0, falling short of closed wings from 0·6 to 0·8; tarsus 0·7 to 0·8; middle toe and claw 0·75 to 0·8; bill to gape 0·75 to 0·8; expanse 18·0. *The tail is not forked in this species.*

Iris dark brown; eyelid brown; bill black, gape and basal part of margins red; legs and feet neutral brown or plumbeous brown.

Male. Above, including the wing-coverts, uniform pale sandy brown, darker on the forehead, and passing from the sides of the neck in a paler wash over the chest; a white orbital fringe; quills, *axillary plume*, and *under wing-coverts*, with the terminal portion of the tail *black*, the latter decreasing in extent to the outer feather; at the middle of the 5th and 6th primaries a marginal spot; inner webs of primaries at the base, the secondaries, except at the tip and terminal outer edge, margins of the greater coverts, and some of the adjacent tertials white; chin albescent, blending into rufescent fulvous on the throat; upper tail-coverts, tail, lower parts, and breast white, blending into the pale brownish of the chest; tips of all but the two outer rectrices whitish.

Female. Differs (so far as I have observed) in wanting the white marginal spots on the 5th and 6th primaries, and in the less amount of black on the lores.

Young. Birds of the year have the upper surface fulvous brown, darker on the head, and with the tips of the feathers ochreous, with a dark crescentic ray; this is present even on the primaries; least wing-coverts more rufescent than the rest; tail blackish brown, changing to ochreous at the tips; chin and throat whitish, spotted with blackish brown; chest duskier than in the adult. Birds not quite mature have pale edges to the feathers of the upper surface, and the throat is faintly tinged with buff; the lores a little darker than the forehead. The gape is not so red as in the adult. Wing 5·4 inches.

Obs. The dimensions of Pegu specimens are given by Mr. Oates as follows:—length 6·7 inches; expanse 17·2 to 17·5; wing 5·7 to 5·8; tail from vent 2·1; tarsus 0·75 to 0·81. Mr. Armstrong records the measurements of a male shot near Elephant Point, Burmah, as—length 6·5; expanse 16·2; wing 5·5; tail from vent 2·15; tarsus 0·9. Ceylonese specimens therefore average larger than these eastern birds. Individuals in the national collection now before me, however, measure in the wing 5·7, 6·1, 6·3 inches respectively; they are from Dinapore and Northern India (localities not stated), and correspond almost entirely with Ceylonese specimens, though the throats are scarcely so brightly coloured, notwithstanding that the fulvous hue of the chest descends in a measure over the lower breast, which part is consequently not so white as in my insular specimens.

Distribution.—The Lesser Swallow-Plover was discovered by myself in June 1873 at Hambantota; I then for the first time procured specimens; but I had noticed it in March of the previous year on a salt lagoon near Kirinde. Large flocks frequented the hollows in the great sand hill west of the town, as well as the dried-up shores of the leways in the daytime, and assembled at twilight and at early morn to hawk over some swampy ground near the curious wells. They appear to be resident all the year round in this district;

the inhabitants of the town were familiar with them, and informed me that they bred in the sand hills in Mæreh. In the following October I received some specimens from Mr. J. Williams, of the Ceylon Public-Works Department. In October 1874 I met with a large flock frequenting the shores of Kottiar Bay, near the mouths of the Mahawelliganga. It is likewise to be found, I believe, in the north of the Jaffna peninsula, and was perhaps observed there by Layard, though he did not record it in his notes. When I described the bird to him in 1874, during our voyage to the Antipodes, he remarked that he believed he had seen it at Pt. Pedro on one or two occasions. I am not aware that it has been seen on the west coast.

On the mainland this little Pratineole is chiefly found from the Deccan north-eastwards to Bengal, and thence ranges into Burmah and Tenasserim. I do not find it recorded from the extreme south, and, in fact, Messrs. Davidson and Wenden's notice of it on the river Blima, in the Deccan, during the cold season, is the most southerly register of its occurrence that I have noticed. Mr. Ball notes it from the Godaveri valley, Raipur, and Orissa north of the Mahanadi, also from Sambalpur, north and south of the same river, and finally from Lohardugga, Manbhum, and Bardwan. Captain Beavan likewise observed it on the sand banks of the Damoodah river, near the Manbhum district. It extends throughout Bengal and the North-west Provinces, breeding along the banks of the Ganges and Jumna, and is also recorded from the Nerbudda and the Indus; and to this latter river it would appear to resort in the Punjab to breed, for it is not said to inhabit Sindh at all. Turning east again we find Mr. Cripps writing of it as being rather common in Furreedpore, frequenting sandy shores on the main rivers.

Captain Feilden and Mr. Oates notice it as common on the sand banks of the Irrawaddy; and Dr. Armstrong met with it near Elephant Point, although it was rare there. It does not range far towards the south, being recorded, as regards Tenasserim, only from the tract of country between the Salween and Sittang rivers, where it was met with by Mr. Davison on small creeks or in the Thatone plains.

Habits.—The Lesser Pratineole delights in sand banks and bare places near water. The great red sand hills near Hambantota, where I first discovered it in Ceylon, formed a splendid shelter for it; in the hollows of this vast formation it was found in little troops of a dozen or more, reposing during the heat of the day, in company with small flocks of the large Sand-Plover (*Ægialitis geoffroyi*); or else the dry foreshores of the salt lagoons were resorted to, and there it might be seen sitting in pairs or several together in scattered company.

It is just as crepuscular, if not more so, than the preceding species; long after sunset, when it could scarcely be seen in the dusk of the evening, I noticed it hawking for insects about water-holes, flying very rapidly, with something of the action of the Nightjar, but with more speed and power; in the early morning it commenced again to feed, but desisted about 6 A.M., and scattered over the district to rest in the localities above named. When roused in the daytime, its flight is like that of the Lesser Tern; but it can at once be distinguished from this bird by the black axillaries and under wing-coverts. It walks slowly but easily, taking a few little paces and then halting. Its food in Ceylon consists of grasshoppers, moths, flies, and green bugs, of which latter it devours enormous quantities.

Jerdon writes of it, "Now and then large parties are seen hawking over the plains and fields; but it prefers hunting up and down the banks of rivers, over sandy shores, and by large tanks. In localities where they abound, vast parties may be seen every evening after sunset taking a long flight in a certain direction, capturing various insects as they fly. They live entirely on insects, which they capture in the air, in many cases Coleoptera. Several which I examined had only partaken of a species of *Cicindela*."

The Pratineoles were originally styled *Perdrix de mer* by the French, a name singularly inappropriate.

Nidification.—In the south-east of Ceylon the small Swallow-Plover must breed at the beginning of the year; for I shot the young in yearling plumage in June. They evidently nest on the great sand bank. In Northern India it breeds in Mæreh, April, and May, and nests in company with Terns and Skimmers (*Rhynchops*), depositing its eggs a little apart from these latter birds. Mr. Hume thus writes of its nidification:—"The nests are mere holes in the sand, three inches or so across, and an inch or an inch and a half deep. Where the bank is absolutely unfrequented and unvisited, these holes are scratched in the open, without the slightest attempt at concealment; but where boatmen towing boats are passing from time to time, there the birds generally make their nests at the roots of, and partly concealed by, tufts of grass or

tamarisk-bushes. The nests are never lined in any way. Four is the full number of eggs; but three, and even two, are often found much incubated. . . . The strange antics played by these little birds, at least those of them that had young or hard-set eggs, whenever we approached their treasures were very remarkable: flying past one they would come fluttering down on to the sand a few paces in front of one, and there gasp and flutter as if mortally wounded, hobbling on with draggled wings and limping legs as one approached them, and altogether simulating entire helpless and completely-crippled birds. . . . I have seen Peewits and other Plovers behave somewhat similarly; but these little Pratineoles seem to me to be cleverer performers than any birds I had ever seen."

GRALLÆ.

Fam. HÆMATOPODIDÆ.

Bill long or stout. Wings lengthened. Tail moderately short, of 12 feathers. Legs moderate, the anterior toes connected by a web moderately developed; hind toe wanting.

Of moderately large size, without a change of plumage in the summer. Of purely littoral habit; gregarious; shellfish eaters.

Genus HÆMATOPUS.

Bill long, straight, compressed from the nostrils to the tip, which is slightly obtuse; the commissure ascending from the centre to the tip; nostrils linear, placed in a membrane at the base of a long groove. Wings long, pointed, the first quill the longest; tertials lengthened. Tail short, of 12 feathers. Tarsus stout, short, and reticulated in front and behind. Toes short, broad, connected at the base by a web, considerably developed between the outer and middle toe, and extending along the sides as a narrow membrane; nails broad and short; hind toe wanting.

Palate bony.

HÆMATOPUS OSTRALEGUS.

(THE OYSTERCATCHER.)

Hæmatopus ostralegus, Linn. Syst. Nat. i. p. 257 (1776); Gould, B. of Eur. pl. 300 (1837); Jerdon, Madr. Journ. 1840, xii. p. 201; Blyth, Cat. B. Mus. A. S. B. p. 264 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Schrenck, Reis. u. Forsch. Amur-L. p. 413 (1860); Schlegel, Mus. P.-B. *Anseres*, p. 70 (1864); Jerdon, B. of Ind. iii. p. 659 (1864); Holdsw. P. Z. S. 1872, p. 472; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1039 (1873); Hume, Str. Feath. 1873, p. 234, et 1879, viii. (List B. of Ind.), p. 112; Irby, B. of Gibraltar, p. 163 (1875); Legge, Str. Feath. 1876, p. 234; Seebohm & Harvie Brown, Ibis, 1875, p. 290; Dresser, B. of Eur. pls. 63, 64 (1877); Butler, Str. Feath. 1877, p. 212.

Hæmatopus hypoleuca, Pallas, Zoogr. Rosso-As. ii. p. 129 (1811).

?*Hæmatopus osculans*, Swinhoe, P. Z. S. 1871, p. 405; id. Ibis, 1875, p. 129; David & Oustalet, Ois. de la Chine, p. 432 (1877); Blakiston & Pryer, Ibis, 1878, p. 219.

L'Huître, Buffon; *Sea-Pie*, popularly in England; *Scholekster*, Dutch; *Ostraceiro*, Portuguese; *Austernfischer*, German. *Darya gajpaou*, lit. "Sea Longshanks," Hind.; *Yerri kali ulanka*, Telugu; *Tetawuk*, Kabul (Blyth).

Female, full-grown (Ceylon, March). Length 17.0 inches; wing 10.0; tail 4.0; tarsus 2.13; bare tibia 0.8; middle toe and claw 1.7; bill to gape 3.25, at front 3.2.

Adult female (Wales, November). Length 16.3 inches; wing 9.6, expanse 31.0; tail 4.0; tarsus 1.9; middle toe and claw 1.6; bill to gape 3.0, at front 2.85; weight 15½ oz. A series of English and European examples measure:—wing 9.4 to 10.3; tail 3.9 to 4.0; tarsus 1.8 to 2.15; middle toe and claw 1.6 to 1.7; bill at front 2.45 to 3.1.

Adult male (Kurrachee). Length 15.5 inches; wing 10.0; tail 4.4; tarsus 2.1; bill at front 3.1. Weight 1 lb. 6 oz. (Hume.)

Female (Cheefoo: *H. osculans*). Length 19.5 inches; wing 10.6; tail 4.65; tarsus 2.2; bill at front 4.0 (*Swinhoe*). —*Male* (Shanghai: *H. osculans*). Length 18.5 inches (0.47 m.); tail 4.3 (0.11 m.); tarsus 2.17 (0.055 m.); bill at front 3.95 (0.10 m.) (*David*).

Obs. The bill of the Oystercatcher varies greatly in length, depending on the degree in which the tip is worn off: many examples shot on rocky coasts have the extremities quite truncated, measuring perhaps $\frac{1}{2}$ inch in width, the appearance of the outer surfaces of the mandibles showing that this is the result of friction; the Chinese form, *H. osculans*, which I doubtfully include with ours, appears to have normally a considerably larger bill, as will be seen by the above measurements; Mr. Hume gives the extreme length in Indian specimens as 3.6 inches. Asiatic specimens appear to *average* larger in the tarsus than European.

Iris variable, orange-red, red, brownish red; eyelid orange-red; bill orange-red at the base, the terminal half of the upper mandible changing to blackish, and the tip of the lower mandible to brownish; legs and feet dusky purplish (in spring purplish pink); feet dusker than the tarsus.

Head, entire neck, and upper back uniform coal-black, with a small white patch beneath the eyelid; scapulars, tertials, wing-coverts, primaries, and the terminal portion of the secondaries and terminal portion of the tail brownish black, not so intense as that of the head and throat; greater wing-coverts, except at the base, the inner secondaries entirely, and the rest, with the exception of the above-mentioned portion, white; the greater part of the inner webs of the primaries, from the base outwards, white, running onto the centre of the outer webs of all but the first two primaries, and ending on the third in an elongated shaft-patch; first two primary-shafts white near the tip, the remainder white where the webs are this colour; entire under surface, with the under tail-coverts and under wing, as also the back, rump, upper tail-coverts, and basal two thirds of the tail, white.

In winter specimens which I have examined there is generally a more or less extensive white bar across the upper part of the throat.

Nestling, in down. Above iron-grey, mottled with buff, darkening into blackish on the throat; sides of the rump and the tail black; crown with a large patch of black, and mottlings of the same on each side; a black stripe through the lores; two stripes of black down the back, and another along the wings; beneath white. Bill at front 1.0 inch.

Further stage. Wings and breast feathered; crown and ear-coverts pure black; rest of the head and neck in down as above; a dark stripe on each side of the chin; back and wing-coverts brownish black; primaries and secondaries as in the adult; tertials and wing-coverts tipped with rufescent; tail in down still; a black patch on each side of the fore neck; the feathers at the junction with the white tipped with rufous; there is *no trace of white* across the throat; below the chest white; bill at front 1.4 inch, yellow at the base, tip black; feet yellow.

Immature, first autumn. Black of the upper surface not so intense as in the adult; the scapulars and wing-coverts brownish black, tipped finely with fulvous; the *terminal portion of the longer upper tail-coverts* black, barred with fulvous or deeply tipped with the same; coloration of the throat variable, in some with a broad white band running up in a point towards the chin, in others with scarcely a trace of white.

Obs. The excessive development of the white on the throat in immature birds I believe to be an individual peculiarity. The example above detailed from Ceylon, which must be nearly a year old, is a case in point; the white throat-band is an inch wide, and extends forward in a stripe to the chin; there is more white than usual on the primaries and secondaries, extending to the 2nd primary and also to the tertials; and the upper tail-coverts are entirely white, which is unusual in a bird not fully adult.

The Chinese form, *H. osculans*, Swinh., appears to me scarcely worthy of separation, being merely a somewhat larger, longer-billed form, with perhaps less white on the primaries. Swinhoe describes the first three primaries as black; should this character be constant, the race might perhaps be considered distinct. The black tipping of the upper tail-coverts, however, is quite a worthless diagnostic, as it exists in the European bird.

H. longirostris, Gm., found in Australia, is allied to the European bird, but has the axillaries black and white, and the black of the throat descending upon the breast; the upper tail-coverts are tipped with black, and the black portions of the plumage glossed with green. It is likewise longer in the wing; an example in my collection measures—length 17.8 inches; wing 11.2; tail 5.0; tarsus 2.3; bill at front 3.03.

H. unicolor, Forster (*H. fuliginosus*, Gould), inhabiting the same region, is entirely sooty black. Length 18.0 to 18.5 inches; wing 11.3 to 11.75; bill at front 3.0 to 3.2. Both these species feed largely on mussels.

The African Black Oystercatcher is *H. moquini*, Bp. There are other American species—*H. ater* and *H. palliatus*.

Distribution.—The Oystercatcher is a rare species in Ceylon, and probably not a regular seasonal visitor. It is only found in the north and on the northern half of the west coast; and during several years' sojourn at Aripu Mr. Holdsworth does not appear to have met with it. Layard records only seeing one or two specimens in the month of January in the Jaffna estuary. In March 1876 I met with about half a dozen on the Jaffna Lake, near Kalmunai Point, several on the Erinativoe Islands, and a small flock on the Manaar flats. In October of the same year I saw three on the curious ledged beach near Chilaw, which would be sure to attract them were there any on that part of the coast. On the east coast I never met with it.

The range of this species is very great, extending from Greenland, in the south of which several examples have been killed, across the entire continent of Europe, taking in North Africa and a large portion of the east coast of that continent, to Asia, across which it ranges to Japan and China and southward to Ceylon. Jerdon remarks that it is found on both coasts of the peninsula of India; but as regards the eastern side, I find no record of its having been recently found north of the Godaveri, and it has not been noticed on the Burmese coasts. It is a winter visitor to the west coast, and not uncommon, according to Jerdon, at Tellicherry. Towards the north it is said to be common on the Kutch and Kattiawar coasts, and in Kurrachee harbour Mr. Hume found it to be abundant, and in the hot season it has been noticed there by Capt. Butler; this gentleman likewise observed it in numbers at Mandavce. Along the Mekran coast and in the Gulf of Persia it is not uncommon, as also on the shores of the Caspian Sea. Severtzoff says that it breeds in the north-west of Turkestan, the locality being, I presume, the shores of the Sea of Aral or the banks of the Syr-Daria. In Western Siberia it ranges far to the north, as Dr. Finsch observed it on the Ob nearly as high as Obdorsk;

not so, however, further east, where the Amoor appears to be its most northern limit. In this region Sehrenk records it from the mouth of the Ussuri, which enters the Amoor a long way from the sea, and obtained it on the latter river lower down. Middendorff procured it also on the Shantar Islands in the Sea of Okhotsk; and Pallas records it from the coast of Kamtsehatka and the Kurile Islands. If we unite the Chinese species with it, we find this Oystereatcher in Japan on the island of Yezo and about Yokohama. Southwards it is found in limited numbers as far down the Chinese coasts as Swatow, breeding in Talien Bay.

Turning towards Western Asia, we find it recorded from Asia Minor; but it was not noticed by Canon Tristram in Palestine. Messrs. Elwes and Buckley observed it at Salonica, where it is not common; but on the coasts of the Black Sea it is pretty generally distributed, according to Von Nordmann, though it does not winter on the north coast. It occurs in Sicily, Malta, and Sardinia in spring and autumn, and in the latter island is also found at all seasons, according to Mr. Brooke. It is rare in Italy, being found there chiefly in winter and spring; and on the coasts of the Epirus it was only seen by Lord Lilford in March and April. In Transylvania it is rare, and met with chiefly during spring migration to the north. It is not very common anywhere in Germany or Poland; and in these countries, as also to the northward, is chiefly found in the breeding-season, arriving in Denmark and Sweden in March, and further north, in Finland, in April. Mr. Durnford found it breeding in the North-Frisian islands in May. In Northern Russia it is not uncommon in the breeding-season, particularly on the White Sea; and Messrs. Seebohm and Harvie Brown found it on the Petchora as far north as the Arctic circle. It is common in Sweden, and in Norway some remain during the winter on the south coast. It is a resident in Great Britain, breeding in the Farne Islands and in Scotland. In the Faroes it is common, and breeds in numbers there; and in Iceland it is also not uncommon, frequenting the south coast even in winter. It is most abundant on the English coasts in autumn and winter; and in Belgium and France where it is common, it is chiefly an autumn, winter, and spring resident. In Portugal it is well known; and on the south coasts of Spain it is found from autumn till spring, the latest recorded by Col. Irby having been seen by Lord Lilford on the 5th of May near the mouth of the Guadalquivir. In Morocco Favier says that it is a bird of passage, passing north in April and May, and returning in October. In the Red Sea, curiously enough, it seems to be a resident. Von Heuglin met with it in pairs and families throughout the summer near Qoseier, Sauakin, in the Dahlak Islands, at Amphila and Belul; and in November and December he saw it on the Somaui coast. On the Egyptian coast Capt. Shelley only met with it in winter. It appears to extend down the east coast to Mozambique, where it has been observed by Peters. It likewise strays down the west coast, for there is a specimen in the Leyden Museum from Senegambia; but elsewhere in that region it has not been observed.

Habits.—This well-known bird is, next to the Common Curlew, one of the most wary species that frequent the shores of the Old World; yet at times it will admit of a near approach, particularly when there is a strong wind blowing from the sea, and it happens to be resting in a little flock on some rock near the water's edge. At such a time it will also fly pretty close to the fowler; and I have known a man to kill more than a dozen out of a closely packed flock at one shot. In rocky districts it always frequents the rocks which are uncovered at low water, and subsists on limpets, mussels, and other shells, which it strikes from the rocks or divides asunder with a sharp blow of the bill. The constant wear to which the tips of the mandibles are thus subjected soon blunts them, and they become quite stumpy. Its food, however, on sandy shores, and particularly in the tropics, where the above-mentioned shellfish do not exist in such numbers, consists almost entirely of sea-worms and slugs, minute bivalves, and crustaceans, which I have found swallowed whole in its stomach; and it is noteworthy that the mandibles are not found so much worn down as on the rocky shores of temperate seas. It generally associates in small families or troops of from six to a dozen; but in the early winter in Europe it collects in much larger flocks. Its note is a clear and loud whistle, which it utters sometimes in consort just before the troop take wing from the rocks, and also when they are on the wing; when single birds are flushed, they generally utter their whistle, perhaps as an alarm-note to their companions, who may be not far off. Its flight is swift, strong, and straight-on-end, and performed with quick, far-reaching strokes of its pinions, which are held extended above the back as it alights. As must be apparent, the name given to this bird is a misnomer, as oysters are not, as a rule, found clinging to rocks uncovered by the tide; and it is a question whether the bird *ever* eats an oyster. It displays admirable dexterity in manipulating the shells of

its favourite food, the limpet and the whelk; and as illustrative of its adroitness I transcribe the following interesting paragraph, contained in Mr. R. Gray's 'Birds of West Scotland,' and quoted by Mr. Dresser in the 'Birds of Europe':—

"I recollect seeing about thirty in a flock pitch upon a shelving rock, from which the waves had just receded, and commence an attack upon the limpets, which were very numerous. Being within three or four yards of them, I could distinctly perceive their movements, and could not help being struck with their dexterity in overturning the shells and scooping out their contents. Sometimes a bird would run forward to a limpet, and bend down its head sideways, as if in a listening attitude; then it passed to another and another, repeating the scrutiny, apparently to see if the shell was at all raised from the rock, until it found one ready for treatment, which it immediately put in force by thrusting its thin pointed bill suddenly between the edge of the limpet and its point of attachment, and turning it neatly over. One foot was then placed on the object and the animal taken out as clearly as if done with a knife or other sharp instrument. Another favourite feeding-ground is some sheltered bay, where a pair or two will often station themselves for a few hours, boring the wet sand for annelids, which I have seen them pull out of their burrows, and carry to the water for a slight rinsing before being swallowed."

Mr. Thompson made many observations as to the feeding of the Oystercatcher in Ireland, and he found the stomachs of those he examined to contain chiefly mussels, whelks (with their opercula), and limpets. Twenty-five well-sized limpets and about fifty opercula of whelks were found in the crop and gizzard of one example, and in another were a quantity of tender roots and green leaves, with white worm-like larvæ.

The Oystercatcher swims well, and sometimes takes to the water of its own accord, unlike most members of the family. Mr. Durnford remarks that he saw one swimming in the sea off the North-Frisian island of Sylt.

Nidification.—The Oystercatcher breeds in May and June, nesting on shingle near the water or on sand banks or stretches of gravel, and sometimes several pair lay not far from each other. The last-mentioned writer speaks of finding about a hundred pairs breeding in one locality in North Frisia. The nest is a hollow scraped in the shingle or sand, and is sometimes lined with a stray leaf or two or a few grass-bents, but often devoid of any lining at all. A curious site is recorded by Mr. Dresser as having been observed by a naturalist in Norway, and which was a hollow on the top of a felled pine log, in which a nest was constructed. The eggs are three or four in number, and are broad ovals, some slightly pointed at the small end, others scarcely so. A fine series of Mr. Seebohm's now before me are of various shades of grey and stone-buff, and are characterized by their black, bold, somewhat regular-edged and openly-distributed markings, beneath which are small and indistinct bluish-grey spots; the larger spots are collected round the large end, but are not, as a rule, closely set; in some they take the form of immense blotches or clouds, and these eggs are marked with a few dark grey underlying clouds; two have the obtuse end covered with broad hieroglyphic-like streaks crossed and recrossed over one another. They vary in size from 2.31 by 1.53 inch to 2.0 by 1.55, the latter dimensions being those of a very short, rounded egg. A long pointed specimen measures 2.35 by 1.48 inch.

GRALLÆ.

Fam. DROMADIDÆ.

Bill moderately long, stout, with the gonys-angle much pronounced. Legs long. Toes much webbed; hind toe present and well developed.

Genus DROMAS*.

Bill longer than the head, stout, the commissure straight; the culmen curved from the middle, and the upper mandible vaulted; gonys very long, with the gonys-angle pronounced and near the base; nostrils oval, and pierced through the bill. Wings moderately long, with the 1st quill the longest. Tail short and rounded. Legs long; the tarsus scutellate, and more than twice the length of the middle toe; outer toe long, anterior toes connected for nearly half their length by a web, and continued as a narrow membrane along the edges; middle claw pectinated at the tip.

DROMAS ARDEOLA.

(THE CRAB-PLOVER.)

Dromas ardeola, Paykull, Homell, Ac. Vet. Stockholm, p. 188, pl. 8 (1805); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Heuglin, Ibis, 1856, p. 346, et Orn. N.Ost-Afr. ii. p. 1043 (1873); Blyth, J. A. S. B. xxi. p. 352; Jerdon, B. of Ind. iii. p. 658 (1864); Layard, B. of S. Afr. p. 372 (1867); Blyth, Ibis, 1867, p. 166; Newton, t. c. p. 351; Blanford, Zool. Abyssinia, p. 432 (1870); Holdsw. P. Z. S. 1872, p. 472; Van der Hoeven, Annotationes de *Dromade ardeola*, Nov. Act. Acad. L.-C. Nat.-Cur. vol. xxxiii. (1868), p. 281; Hume, Str. Feath. 1873, p. 234, et 1874, p. 293, et 1876, p. 464, et 1879, viii. (List Ind. B.), p. 112 et p. 381; id. Nests and Eggs, iii. p. 584 (1875); Legge, Str. Feath. 1875, p. 220, et 1876, p. 246; Butler, ibid. 1877, p. 212, et 1878, vii. p. 186.

Tringa, sp.?, Salt, Travels Abyssinia, App. iv. p. 49 (1814).

Erodia amphileensis, Salt, Trav. Abyssinia, App. iv. p. 61, pl. (1814); Jardine & Selby, Ill. Orn. ii. pl. 75 (letterpress).

Ammoptila charadroides, Jerdon, Madr. Journ. 1840, xii. p. 216.

Abyssinian Erody, Lath. Gen. Hist. pl. 149 (1824); *Drome Ardeole*, Temm. Pl. Col. pl. 362;

Pied Erodia, Jard. & Selby; *Sand-Plover*, Jerdon, Madr. Journ.; *Crabcatcher* of some. *Hanker*, Arabic.

Adult male and female (Ceylon). Length 15.7 to 16.2 inches; wing 8.2 to 8.5; tail 2.75 to 3.0; tarsus 3.6 to 4.0; bare tibia 1.4 to 1.6; middle toe and claw 1.7 to 1.85; bill to gape 2.9 to 3.0. Iris dark brown; bill black; legs and feet pale bluish leaden or light greyish blue, claws black.

* This singular genus, the only one of its family, is perhaps the most perplexing form among all the Grallæ. Blyth and Layard follow Schlegel in considering it allied to the Terns, the former stating that its young plumage was that of the Sterninæ; but in this he is scarcely correct. Bonaparte held that it was close to the Oystercatchers; and more recently Van der Hoeven has proved that in its anatomy it is close to *Hematopus*, which species I find it much resembles in habits. In its nidification and eggs, however, it has affinities with the Shearwaters; and these anomalous characteristics induce me to place it in a family of itself. Its resemblance to the *Œdicnemidæ* is, in my opinion, only superficial.

Head, hind neck, entire under surface, lower back, upper tail-coverts, shorter scapulars, lesser wing-coverts, a patch below the winglet and entire under wing, except the terminal half of the primaries, white; the occiput nearly always faintly sullied with greyish; a black spot in front of and behind the eye; scapulars, tertials, and median wing-coverts passing from whitish at the base into very pale greyish at the tips; centre tail-feathers and outer webs of the rest of the same colour, paling into whitish on the inner webs; lower part of hind neck, interscapular region, innermost row of the scapulars, outer webs, and terminal portion of the primaries and their coverts, secondaries, greater wing-coverts, and winglet black, passing on the inner webs of the wing-feathers into white, and glossed perceptibly on the back with green.

Nestling in down. "Above dark grey, beneath white. Iris fuscous, bill blackish; feet pale leaden." (*Von Heuglin.*) Captain Butler writes me that the nestling brought to him from the Persian Gulf was covered with uniform greyish-white down, with black bill and dark legs and feet.

First plumage (Massowah). Head and hind neck grey, the feathers with black central stripes; lower hind neck, interscapular region, and the innermost scapulars greyish black, the feathers margined with brownish grey; scapulars, tertials, and wing-coverts smoky grey; primaries and secondaries brownish black; tail smoky grey, tipped with white; beneath white, tinged with grey across the chest; the grey chest and the pale margins of the interscapular feathers are the signs of the first plumage. In the *following winter* the head is whitish, the black stripes contrasting more with the margins of the feathers than in the quite young bird; the interscapulars are blackish pervaded with grey, but not conspicuously margined as before; the grey hue of the wings and tail paler than before; under surface all white. In the *second year* the occiput, nape, and down the centre of the head are light ashy grey, the crown having become almost white; and the black portions of the plumage are quite as glossy as in the adult. In this dress birds are often procured in Ceylon.

Obs. Indian examples correspond with Ceylonese in size. Those I have examined measure:—wing 8.3 to 8.6; bill to gape 2.9 to 3.2 inches. Mr. Hume gives the dimensions of four Andaman examples as:—Length 15.65 to 16.0; wing 8.05 to 8.3, expanse 28.5 to 29.5; tail 2.75 to 3.0; tarsus 3.5 to 3.75; bill from gape 2.75 to 2.8; weight 15 to 17 oz. The latter item, considering the size of the bird and its large head and bill, is noteworthy. Von Heuglin's measurements of North-east African examples do not equal those of Asiatic birds; but those of a Red-Sea specimen, referred to above, do; and Layard gives the dimensions of South-African examples as—wing 8.0 inches; tail 2 inches 9 lines. Von Heuglin's are:—length $14\frac{1}{2}$ inches; wing 7 inches 8 lines to 7 inches 10 lines; tail 2 inches 6 lines; tarsus 3 inches $3\frac{1}{2}$ lines to 3 inches 8 lines; bill at front 1 inch $11\frac{1}{2}$ lines (?) to 2 inches 3 lines.

Distribution.—The Crab-Plover is found chiefly on the north shores of Ceylon. It occurs also on the Jaffna islands, having been sent to Sir W. Jardine from Delft. On the east side of the island I have met with it as far south as Trincomalie; and I have no doubt it will occur as a straggler down the whole of the coast; on the west side it is common as far as Manaar, and an occasional visitant to places as far south as Colombo, where it has occurred but once to my knowledge, when an example was shot by Mr. Bligh on the Galle face, on the 14th October, 1871. Further north it was procured by Layard on the Calpentyne lake. On the Manaar sand flats it was observed by me in great numbers in March 1876, and I have no doubt that it frequents, and perhaps breeds on, the sand banks of Adam's Bridge. I saw it higher up the coast on the same occasion, but did not meet with it at Jaffna. In the Trincomalie district it is not uncommon, and frequents the shores of the salt lagoons and the mouths of the estuaries by which these backwaters discharge into the sea. On the Peria-kerretje lake it is, perhaps, as numerous as anywhere in that district; for I have met with it there in small flocks of half a dozen or more. I have not noticed it anywhere in the hot season (May to September); and it is probably, for the most part, a cool-weather visitant to Ceylon, departing north to the coasts of India in April, although some most likely remain throughout the year and breed in the locality above mentioned. The sand banks of Adam's Bridge should certainly be explored with a view to the discovery of a breeding-place of the species among them.

The habitat of the Crab-Plover may be said to consist of the shores of the Indian Ocean, including some of the Mascarene islands from Natal northwards to the Red Sea, then round the coasts of Arabia, Persia, and India down to Ceylon, including the Laccadive group, and thence up the east coast as far as Nellore, and perhaps further north, and finally extending eastwards to the Andamans and Nicobars.

Commencing with the last-named islands we find Von Pelzeln recording it as having been procured by

the 'Novara' Expedition; while in the Andamans it was procured by Capt. Ramsay at South Andaman, Port Blair, and Macpherson Straits, at which latter place Mr. Hume likewise procured it. It is further recorded by Capt. Beavan as being very common on those islands. On the east coast of the Indian peninsula Jerdon observed it far from rare near Nellore at the mouths of rivers and along backwaters. It was met with on the east coast by Mr. W. Elliot, and in the Laccadives Mr. Hume saw a flock at Pere-Mull-Par in February. On the coast of Kattiawar it has been procured, and in Kurrachee harbour it has been seen in January, and during the hot season by Capt. Butler, who likewise obtained it at Maudavee. Writing in 'Stray Feathers,' 1878, p. 186, he says, it is not very uncommon at Kurrachee, and breeds in the Persian Gulf, as a young bird was caught in June on one of the islands opposite Bushire. It was also procured at Baba Island, west of Sindh, by Major Le Messurier. Along the south coast of Arabia it must needs occur, as in the Gulf of Aden and southern portion of the Red Sea it is, according to Von Heuglin, common. This is one of its great breeding-grounds; but northwards of the tropic, this writer says, it only occurs as a straggler. It is resident here on the low-lying parts of the coast and on the coral islands, living in pairs and families, except in late autumn and winter, when it assembles in flocks.

On the Abyssinian coast Mr. Blanford likewise discovered it; he writes that it is not uncommon, associating there in flocks; it was obtained by Salt on the coast of this country, behind the village of Madir, in the Bay of Amphila, from which he took its specific title of *amphilensis*. It extends down the entire coast to Natal, where Mr. Ayres procured it. In this region Layard says, in his 'Birds of South Africa,' that its favourite localities are sand banks far out to sea; it is apparently, however, rare so far south as Natal. From Madagascar Hartlaub, Schlegel and Pollen record it; the latter authors write, in their 'Recherches sur la Faune de Madagascar,' that it is not rare in the north-west of this island, being found along the coasts in flocks of from six to twelve. In the Seychelles, Mr. E. Newton procured it on the island of Curicuse, and was told that it was not uncommon there, but that seldom more than two or three were seen together. This was in the month of February.

Habits.—This remarkable bird, concerning the true position of which there has been so much difference of opinion, is strictly an inhabitant of the sea-shore, frequenting sand banks, beaches, the edges of salt lagoons and backwaters, and, in some places, coral reefs, to which it appears to be especially partial. In its flight, its sociable habit of collecting in little flocks (which rest in close company on rocks, sand banks, or other spots at the edge of the tide), its mode of feeding, and finally in its note, and the way this is sometimes uttered in consonance, it closely resembles the Oystercatcher. Layard, who followed Schlegel and Blyth in considering it allied to the Terns, appears to have observed it flying past him out at sea; but it is not its habit to leave the sea-shore, unless flying to some given point; and if he met with it off the island of Manaar, it was probable that the birds seen were flying from the sand banks of Adam's Bridge to the mainland. Though sociable at times when feeding, they are often seen singly or two or three together, walking about with quick short strides and erect carriage, stopping every now and then to make a peck at some object of their search. When solitary it is very wary, and invariably gets up before one is within gunshot; but when in little troops it is not so shy, and may be approached tolerably close. Its highly webbed feet enable it to swim well; and one which I winged swam so fast that it nearly escaped into deep water before I could stop it with a second shot. When feeding they are silent; but when packed in flocks and alarmed by the approach of some one, or when being joined by some of their fellows, they utter a loud and not unmusical note in consonance, which, mingled with the roar of the surf, has a peculiarly wild and pleasant sound. I have always found the remains of crabs in the stomachs of those I have examined; but Von Heuglin says they also feed on worms, spawn, and small fish, which is the diet spoken of by Schlegel; Salt, however, states that the pair he shot in the Bay of Amphila had their stomachs full of locusts. The curious calling-crab (*Gelasinus*) and the burrowing sand-crab (*Ocypode*) form the main portion of their diet in Ceylon; their powerful bills are well constituted for the disposal of such prey, and, judging by the scratched appearance of the mandibles, the hapless crustaceans often show fight before they are dismembered. The body of the crab is broken by a stroke of the heavy bill, and the contents devoured, after which the Crab-Plover swallows the claws whole. As above remarked, they are sociable birds; and Mr. Hume has noticed them at high water, collected together in a dense crowd, as closely packed as they could stand on a single isolated rock. They consort but little with other species, according to my experience, the Greenshank being the only bird I have seen in company with them. Von Heuglin,

however, speaks of it mingling with other shore-birds, which place themselves under its leadership, as nothing escapes its sharp scrutiny. The flight of the Crab-Plover is tolerably swift; it is low and straight, and performed with sharp but rather slow-timed beatings of the wings, with the legs carried out behind it; and when a flock fly together, they pack as closely as any shore-bird in existence. The last-named author has noticed that they sometimes depress their wings and lower the head and neck like long-necked Sandpipers; this, it is presumed, happens when they are about to alight. He also observed that at low water they were to be seen between half-dry coral banks, each pair or several pairs occupying a fixed hunting-ground, about which they either ran or flew, reminding him in this respect of the "Thicknees." Schlegel remarks that when surprised they run with great speed, frequently stopping and turning round the head before flying off; at twilight he noticed they were less shy, and permitted a near approach; he likens the note to the syllables *koak, koak*.

Nidification.—The nidification of this curious bird was made known by Von Heuglin, who found it nesting on sand banks in the Red Sea. It has also been found breeding, by collectors of Captain Butler, on an island in the Persian Gulf, and eggs sent home as belonging to it, which are considered by this naturalist to have been satisfactorily identified. Von Heuglin thus describes the breeding-grounds of the Crab-Plover:—"The nesting-places are on flat and lonely coral islands, more or less far from the edge of the water, and always in spots where banks of sand and small shell-fragments have been formed. Numbers of crabs generally live in these banks in deep slanting holes, and exactly similar to these are the furrows in which the Crab-Plover resorts to nest in; but whether it excavates them itself, or takes possession of the crab-holes for this purpose, I cannot say; but I believe, judging by their narrow diameter, that they originally were the work of crabs. They lie pretty close together and open generally towards the strand, and have a diameter of 5 or 6 inches, and are from 2 to 4 feet deep. It was not possible to make a minute examination of the holes, as when the sand was excavated they invariably fell in. The inner third of the passage appeared generally to bend to the right or left, and the cup-shaped nest-cavity was very small. In several (it was in the month of July) we found a half-grown young one. Before the entrance lay the fragments of a proportionately large, somewhat stumpy-shaped, dirty-white egg, with a transparent yellow appearance. One of the nests contained grass-roots and seaweeds, which probably, owing to the dampness of the nest, combined with the high temperature, underwent decomposition, and thus furnished the eggs with sufficient warmth for incubation, as is the case with the *Megapodes*.

"The young appear not to forsake the nest for a long time, though they can run right well. They seemed to be blinded by the daylight, chirped like young chickens, and ran as fast as possible towards the rocks and stones, so as to hide themselves in the shade."

Through the kindness of Mr. Howard Saunders, I have been able to examine the eggs sent home by Captain Butler, who states they were taken from holes in the sand in an island* in the Persian Gulf, his collector observing the birds leave the nests, and thus identifying them beyond doubt. The series consists of eight specimens, pure white, and resembling the eggs of Shearwaters in shape, but they are much broader at the large end; some are slightly pointed at the small end, while others, though much reduced at that part, have rounded ends. The texture is tolerably smooth; but the shell is pitted. Some of the series measure:—2.52 by 1.75, 2.36 by 1.79, 2.56 by 1.78, 2.47 by 1.75, and 2.52 by 1.78 inches. After incubation the shell would be naturally dirty white, as Von Heuglin describes it.

Layard sent an egg (now in the Calcutta Museum) to Blyth from Ceylon, purporting to be that of this species, and which was no doubt brought to him by natives. It is evidently the egg of the Stone-Plover (*Edicnemus scolopax*), and is described by Mr. Hume as "warm drab-colour, pretty thickly blotched, streaked, and spotted with deep blackish brown." Its dimensions are 2 inches by 1.4.

* The same post has brought me the proof of this article and Nos. 2-5 'Stray Feathers,' 1879, with Mr. Hume's account of the nidification of this species in the above-mentioned locality. The name of the island is Montafie, situated about twenty miles east of Bushire. Mr. Nash, of the Telegraph Department, who found the eggs, says, "the bird burrows into the sand hills about four feet deep and in the shape of a bow; the passage runs about a foot below the surface of the ground, and the entrance is usually near or under tussocks of grass or low shrubs. The egg, which is solitary, is laid on the bare soil at the end of the hole, without any sign of a nest." I am glad to find that Mr. Hume notices the affinities of this species with the Shearwaters.

Order GAVIÆ*.

Bill and nostril varied. Wings lengthened, with 10 primaries. Tail even or forked. Legs short; tibia bare more or less above the knee; tarsi compressed laterally. Feet more or less fully webbed; hind toe very small (in one family only represented by a nail) and placed above the anterior ones.

Nidificating on the ground, as the last family, and the young likewise *autophagous*, or following the parent from the egg. Plumage thick and close. Of powerful flight.

Fam. LARIDÆ.

Bill straight; nostrils lateral and linear; gonys short and deep in some, long and less pronounced in others, the tip of the mandible hooked in one group. Wings long, 1st quill the longest; secondaries short. Tail variable in length, of 12 feathers, even or cuneate in some, forked in others. Feet webbed, the inner web incised in some; hind toe present.

Sternum with double shallow notches, rounded at the apices.

Subfam. STERNINÆ.

Bill straight, rather slender, the tips of both mandibles acute; the gonys long and slightly pronounced; nostrils linear and pervious. Primaries lengthened. Tail variable, in some emarginate, in others deeply forked. Legs and feet small, inner web more or less incised in most.

With a change of plumage in summer, acquired by a moult. Not of natatorial habit.

Genus HYDROCHELIDON.

Bill typically short, less compressed than in the next genus, the gonys short; nostrils widened. Wings long, exceeding the tail when closed, with the 1st quill considerably longer than the 2nd. Tail short, emarginate. Legs and feet small; webs very deeply scalloped, the inner joining the middle toe at its 1st joint; claws long and curved.

* The relations of this order with the great Limicoline group which has just been dealt with do not seem to have been sufficiently recognized. The Gaviæ, as dwellers on the sea, are merely altered forms of shore-birds, outwardly modified for more enduring flight and greater powers of progression on the water. Their nidification is similar to that of the *Limicolæ*, their eggs are of the same character, and the young follow the parent from the nest; in every thing, in fact, but flight and note, the *Gulls* and the *Plovers* resemble one another in no small degree. A visit to the Zoological Gardens, where *Oystercatchers* and *Gulls* are kept in the same enclosure, will demonstrate the exact resemblance in form, deportment, gait, and *general* outward appearance that exists between these two genera.

HYDROCHELIDON HYBRIDA.

(THE BLACK-BELLIED MARSH-TERN.)

Sterna hybrida, Pall. Zoogr. Rosso-As. ii. p. 338 (1811).

Sterna leucopareia, Natt. in Temm. Man. d'Orn. p. 746 (1820).

Sterna javanica, Horsf. Trans. Linn. Soc. xiii. p. 198 (1820).

Hydrochelidon fluviatilis, Gould, P. Z. S. 1842, p. 140; id. B. of Austr. vii. pl. 31 (1848).

Viralva indica, Steph. in Shaw's Gen. Zool. xiii. p. 171 (1825).

Hydrochelidon indica (Steph.), Blyth, Cat. B. Mus. A. S. B. p. 290 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 837 (1864); Legge, Ibis, 1874, p. 32; Hume*, Nests and Eggs, iii. p. 648 (1875).

Hydrochelidon leucopareia (Natt.), Holdsw. P. Z. S. 1872, p. 480; Legge, J. A. S. (Ceylon Branch), 1874, p. 58.

Hydrochelidon hybrida (Pall.), Swinhoe, P. Z. S. 1871, p. 421; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1449 (1873); Salvadori, Uccelli di Born. p. 372 (1874); Legge, Ibis, 1875, p. 407; Saunders, P. Z. S. 1876, p. 640; Dresser, B. of Eur. pt. 57 & 58 (1877); Hume, Str. Feath. 1878, p. 49 (B. of Tenass.), et 1879, p. 115 (List of Ind. B.).

The Whiskered Tern, *Common Marsh-Tern*, *Small Marsh-Tern*, of authors. *Samar Saut*, Sumatra (Raffles); *Pater-lahut*, Java (Horsfield); *Kāda kuruvi*, Ceylonese Tamils.

Liniya, Sinhalese; also *Mutheru Kirella*, lit. "Sea-Plover," Villagers in the interior.

Adult male and female (Ceylon). Length 9.3 to 10.8 inches; wing 8.1 to 9.3, reaching when closed to 1.8 beyond tail; tail 3.0 to 3.5; tarsus 0.8 to 0.9; middle toe 0.8, its claw (straight) 0.42; bill to gape 1.5 to 1.8, at front 1.05 to 1.2.

Breeding-plumage. Iris deep brown; bill arterial blood-red or dark lake-red, some with the culmen dusky; inside of mouth and gape bright red; legs and feet arterial blood-red, claws black. These are the normal tints of the soft parts in the breeding-plumage; but the tone of the colour of the bill and feet vary.

Female (Ceylon, April). Forehead, head, and nape black, passing from the bill to the lower anterior edge of the eye, and from the same position behind the eye to the nape; lower portion of lores, face, and ear-coverts white; the lower eyelid black; hind neck, back, scapulars, wing-coverts, upper tail-coverts, and tail dark blue-grey, the wing-coverts and tail slightly paler than the back; outer web of lateral tail-feathers white; inner webs of the primaries brownish grey, the basal portion white, running out in a point into the brownish, the outer webs and tips "frosted"† white when the feather is new; primary-shafts white; secondaries and tertials delicate grey, the former tipped with white; chin white, passing into faint grey on the throat, and gradually darkening on the fore neck and chest into the pure grey-black of the lower breast, abdomen, and flanks; rump and under tail-coverts white; axillaries and under wing white.

Male (Southern Europe). Darker on the back, and the black of the lower parts deeper than in several female examples from Ceylon. In my own collection there are no male specimens in perfect summer plumage.

Winter plumage (Ceylon). Bill (variable) blackish red, dull red, almost black in some; legs and feet likewise varying from dark reddish to dull lake.

* I cannot, for want of space, continue to give more than the leading Indian references.

† The delicate "froosting" or "silvering" of the outer primary-webs in this family of birds speedily wears off, and exposes the dark grey ground-colour of the feather.

Forehead, anterior portion of the lores, face, throat, and entire under surface pure white; lores just in front of the eye striped with black; crown greyish, the feathers with central blackish stripes; occiput, nape, and behind the eye black, the feathers tipped with white; back, wings, and tail pale bluish grey, the latter tinged somewhat with brownish; hind neck just below the black of the nape whitish. The coloration of the head varies, some examples having the crown much more striated than others.

The change to summer plumage takes place by a moult, commencing in Ceylon at the end of February or beginning of March, the head and back changing first, then the dark feathers of the chest and underparts appearing among the white ones; the quills and tail-feathers are moulted in the spring, and apparently at an earlier date than the body-feathers.

Nestling in down. Buff: chin and chest white; forehead and a broad band across the fore neck black, connected by a stripe on each side of the chin; crown and hind neck marked with black, as also the lower back, rump, and wings; on each side of the white chest is a brownish patch joining the black of the throat: bill at front 0·3 inch.

In another specimen, from Galicia, the back is blackish brown, striped and mottled with reddish grey; head and hind neck grey, with less of the reddish tint; crown mottled with black, and down the hind neck a broad stripe of the same; behind the ears a patch of black; beneath greyish, tinged with brown on the throat. The quills are appearing in this specimen, but there is no sign of the scapulars, which generally accompany them. Bill to gape 0·95 inch.

The nestling plumage at first is characterized by the very dark rufous edgings of the upper-surface feathers, and is as follows:—Head blackish brown, striated obscurely with cinereous; ear-coverts concolorous with the head; back and scapulars blackish brown, the bases of the feathers grey and the tips rufous; lower back grey, also the tail and coverts; wing-coverts slate-grey, tipped here and there with mingled brown and rufous; tertials tipped with rufous; beneath white, encroaching on the brown of the hind neck. In course of time the rufous edgings change or fade to buff. In some specimens the tertials and scapulars are deeply indented along the margin with rufescent. This plumage is doffed during the early part of the winter, as late as December in Ceylon, and the blue-grey feathers of the upper surface assumed; the head, however, remains much darker than in the adult in winter; the least wing-coverts are dark grey, and these dark feathers are again acquired in the second autumn, being then the only sign of adolescence.

Obs. No difference of character is perceptible in this bird from any country within its widely-extended habitat. Examples from India, China, Europe, and Africa in size fall within my limits for Ceylon:—"Amoy" (♂), wing 9·0 inches, bill to gape 1·55 (date 28th of August, still in summer plumage); "China" (♀), wing 8·7; "Malta" (♂), wing 8·7, bill to gape 1·7; "South Africa" (Mus. Saunders), wing 8·7. The summer plumage of male Chinese specimens is darker than that of females.

Distribution.—This Marsh-Tern is the most abundant of its family in Ceylon, being found throughout the entire sea-board, and frequenting likewise marshy places, paddy-fields, tanks, and inland waters in both the cultivated and jungly districts of the interior as far in as the base of the mountains, although its numbers in the south and west of the island gradually decrease away from the maritime districts. In the north of the island this rule, however, does not apply so strictly; for Marsh-Terns are found plentifully at the large tanks of Topare, Minery, Padawiya, Anaradhapura, &c., and at Kanthelai it is abundant. It is found in greatest numbers in large paddy-fields and marshes close to the sea. Although a resident in the island to a considerable extent, large numbers leave for more northern latitudes in April and return in September. I have met with it in June and July about the leways of Hambantota and Kirinde in perfect winter plumage, both in adult and adolescent stages, and at Kanthelai and Topare tanks have seen it in summer and winter plumage in August. In the west and south of the island it is found in greater numbers about paddy-fields than on the open coast; but in the north, where the sea-shore is intersected with lakes, backwaters, and shallow islets, it is very abundant on the coast.

This species is very common throughout India, frequenting marshes, rivers, and all inland waters; it extends northwards into Turkestan (where it breeds, according to Severtzoff), and also into Mongolia as far north as the Hoang-ho valley; eastwards it is found in Tenasserim, and probably occurs in Siam and Cochin China, for Swinhoe procured it in Formosa, beyond which it has occurred in the Philippines at Manilla. Southwards in this direction it occurs in Borneo, Sumatra, Java, Celebes, the Togian islands, and is spread most likely more or less throughout Malasia, for it is found in Australia, on which continent Gould procured it in New

South Wales on the Namoi and Mokai rivers, and on the Swan river in Western Australia, while in the interior it was observed by Sturt. Mr. Ramsay records it further from Cape York, Rockingham Bay, Wide Bay, Victoria, and South Australia.

Returning now from this sketch of its distribution in a south-easterly direction to the consideration of its locale in India, I find that it is chiefly a cool-weather visitant to Southern and Central India. In the Deccan Mr. Davidson observed a few individuals only in the rainy season; and further north, in Guzerat, it is not found, according to Captain Butler, in the hot weather; on the eastern side of the peninsula, in the same latitude, it is a cold-weather bird about Calcutta and in Furreedpore; and though I find it recorded from Manbhum, Orissa, and Raipur, and spoken of by Mr. Ball as common on the river Koel, no mention is made of its breeding in those districts. In the North-west Provinces, Oudh, parts of the Punjab, and in Cashmere it breeds not uncommonly, the Woolar Lake in the latter province being a great nesting-resort of the species. It is common in Sindh and at the Sambhur Lake, and in the former Mr. Hume was informed that it bred. Eastward of the Bay it does not seem to be generally diffused, as it is only recorded from the district between the Salween and the Sittang rivers in Tenasserim. It appears to avoid the highlands of Central Asia, but not the lower-lying Mongolian region, where Przevalsky found it breeding abundantly on the Tsaidemin-nor lake. Although found as far north as these regions, it does not range into Siberia, and Schrenk did not observe it on the Amoor. In Palestine it is abundant, according to Canon Tristram, on the Sea of Galilee, and retires in the breeding-season to the marshes of Huleh to nest. In the spring it is found on the shores of the Mediterranean and on the islands, being recorded from Malta as late as the month of May. It inhabits the southern and central portions of Europe as far north as Germany in the summer, breeding in Greece, in Southern Russia, on the Caspian and the Volga, in Hungary (presumably, having been obtained there in June), and on the marismas of Southern Spain; it arrives on passage north in the Gibraltar district about the middle of April (*Irby*), and nests in Andalusia in May. It is an accidental visitor to North Germany and the north of France, and has occasionally been found in England. It does not occur in the Baltic.

It does not extend to America; but there is a specimen in the British Museum from Barbadoes, presented by Sir Robert Schomburgk, whither it had evidently wandered as a very isolated straggler. In Africa it is abundant in winter in parts of Morocco, in Egypt, and in Nubia, and ascends the Nile into Abyssinia. It breeds in great numbers, according to Favier, at Ras Dowra, in Morocco. It is found also in Egypt and Nubia throughout the year; and Von Heuglin is of opinion that it breeds in the country. We have no record of its wandering past the equator on the east coast; but it is found on the western side of the continent; and as it is very abundant in Damara Land in winter, its course of migration is evidently by way of the west coast.

Habits.—This Marsh-Tern, which is the finest of its genus, is a bird of fearless disposition and buoyant and graceful, though not swift, flight, and frequents fresh waters more than the sea-coast, although it is partial to brackish lagoons, shallow salt lakes, and estuaries of large rivers. In Ceylon it is the only Tern seen in the paddy-fields; and as it is of a gregarious nature, large flocks collect there in the autumn while the land is being ploughed, and sometimes follow the natives while they are working, picking up water-beetles and other aquatic insects which become exposed by the upturning of the shiny soil. They are to be seen throughout the season earcoring round and round the Colombo Lake, and flying most perseveringly to and fro, traversing many miles in their course without ever dipping into the water; and when tired of conducting a fruitless search, will fly off again or settle perhaps on the telegraph-wires crossing the lake or the Lotus-pond, and rest there in company with Swallows, occasionally starting off on a fresh cruise in pursuit of the gnats and insects which infest the latter spot. They frequently perch on fences and stakes in the paddy-fields. Their flight is generally low, about 20 feet from the water; and when they descend upon their prey they do not pounce, but, dashing down, they expand their wings, and “dip up” the fish which they have espied from above. At Hambautota I have seen them hovering for an instant over the eggs of the Little Tern, and was inclined to believe that they had eggs themselves; but the individuals I saw so doing were in winter plumage. They do not rest upon rocks, but are often to be seen in little troops reposing on the sandy beach. At nights they resort to beds of reeds or bushes in swamps to roost; and when flying off to their feeding-grounds in the morning they proceed in closely-packed little troops straight-on-end; and if crossing an arm of the sea or

estuary, they take their course close above the surface of the water, not deviating from the direction they have resolved to travel in. Their note is a shrill and not unpleasant little scream, sometimes varied by a hoarse cry, and which they utter very frequently when congregated in some spot supplying them with an abundance of food. They consume very small fish and aquatic insects, as well as worms and various larvæ, and never by any chance alight of their own accord on water.

Nidification.—Though I was not fortunate enough to find the eggs of this Tern, I am under the impression that it breeds to a limited extent in Ceylon. I met with a flock one evening at Topare tank in the month of July, which flew in from the surrounding country and settled in the middle of the morass; and though I was near enough to see that some were in winter plumage as they passed, I think others were in breeding-livery. At Kanthelai I have shot them in the latter plumage in August. In India they breed in June and July, resorting to large jheels and swamps, and building loose nests of rush-stems and reeds on floating vegetation. The late Mr. A. Anderson, who discovered a breeding-colony at Fyzabad (Oudh), situated in a swamp, which is described as a tangled mass of weeds and aquatic plants, observed the birds carrying long, wire-like reeds some 2 feet in length. "The circumference," he writes, "of some of the nests I measured ranged between $3\frac{1}{2}$ and 4 feet, and they were about 4 inches thick. They were composed entirely of aquatic plants, and so interwoven with the growing creepers that it was impossible to remove them without cutting at the foundation of the structure." The eggs were two and three in number; in another instance, recorded by Mr. Hume, nests were found containing only one egg. This author gives the average size of forty-eight Indian specimens as 1.51 by 1.09 inch. A fine series which I have examined in Mr. Dresser's collection are oval in shape, some rather stumpy at the small end, others compressed, having an ovate pyriform appearance. The shell is smooth, without any gloss, and the ground-colour is mostly dull olivaceous or pale olive-grey; but some specimens are brownish stone. The markings consist of large blotches of brownish black or very deep sepia, or small spots of the same, pretty thickly diffused over the egg; some are closely blotched with smeary markings of a lighter hue, and in others these take a straggly form. In one specimen of the series before me, in the collection of Mr. Dresser, the markings are collected on the obtuse end; the underlying coloration is inky grey or pale purplish grey. The dimensions of several eggs are 1.57 by 1.13, 1.53 by 1.12, 1.57 by 1.16, and 1.55 by 1.33 inch.

HYDROCHELIDON LEUCOPTERA.

(THE WHITE-WINGED MARSH-TERN.)

Sterna leucoptera, Meisner & Schinz, Vög. Schweiz, p. 264 (1815).

Hydrochelidon leucoptera (Meis. & Sch.), Buller, B. of New Zealand; Dresser, B. of Eur. pt. 45 (1875); Saunders, P. Z. S. 1875, p. 641; David & Oust. Ois. de la Chine, p. 524 (1877); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Sterna nigra, Linn. *apud* Holdsw. P. Z. S. 1872, p. 481 (first record from Ceylon); Legge, J. A. S. (Ceylon Br.), 1874, p. 58; id. Str. Feath. 1875, p. 376.

Hydrochelidon nigra, Linn. *apud* Swinhoe, P. Z. S. 1871, p. 421; Heuglin, Orn. N.Ost-Afr. ii. p. 1447 (1873).

Hirondelle de mer leucoptère, French.

White-winged Black Tern.

Adult male and female (China). Wing 8.0 to 8.3 inches; tail 2.8 to 3.0; tarsus 0.7; middle toe 0.7, its claw 0.3 to 0.38; bill to gape 1.21 to 1.38. (Europe) wing 7.9 to 8.4; tail 3.0 to 3.1; tarsus 0.8; bill to gape 1.3 to 1.55. (Ceylon) ♀, wing 8.0; bill at front 0.97.

Iris dark brown; bill reddish black; inside of mouth yellowish red; legs and feet orange-red, claws black.

Adult (May, Amoy). Head, neck, and throat deep black, paling to brown-black on the breast and abdomen, and to black pervaded with grey on the interscapular region; back, rump and scapulars, upper tail-coverts and tail white, the latter washed with grey, most darkly on the centre feathers; the lateral pair pure white; least wing-coverts and along the edge of the wing white, passing into dark grey on the greater coverts and tertials; primary-coverts greyish white; secondaries grey, darkening into brownish on the tips of the innermost feathers; first three primaries black, washed with grey on the outer webs, and the inner edges whitish; the remainder frosty greyish white on the outer webs and brownish on the inner, the shafts white; under tail-coverts and under surface of tail white; axillaries greyish black; under wing-coverts black, but the primary series whitish; edge of the wing beneath white.

Winter plumage (Spain). Forehead and crown white; nape and occiput dark grey, as also the back and scapulars; the rump and upper tail-coverts pale greyish, almost white; throat, fore neck, under tail-coverts, and under wing white; breast greyish; in front of the eye a black spot.

The change to summer plumage takes place by a moult in May; the head and throat become interspersed with black feathers, as also the chest, breast, and under wing; and in June the full plumage is donned. The example shot by Mr. Holdsworth is in change as here described. In some specimens the blackish of the lower back ends abruptly against the white of the upper tail-coverts, in others the colours blend. The hue of the wing-coverts varies, some birds being whiter than others.

Nestling in down (Volga, mus. Dresser). Pale yellowish or earthy brown; the crown patched with black, a stripe of the same down the nape, and a spot on each side of it; down the centre of the back a series of black patches branching out at the lower part of the neck and again on the wings; ear-coverts and ears white; down of the throat tipped black.

First autumn plumage. Tarsi and feet reddish brown; bill blackish. Crown, occiput, and nape brown; the white of the sides of the nape *encroaching on the dark colour of the nape just behind the ear*; interscapular region and scapulars earth-brown, the feathers tipped with fulvous; lower back brownish slaty; rump white; tail and the coverts slate-grey, the former tinged with brown and tipped with white; wing-coverts slate-grey, tipped with fulvous and brown; lesser coverts dark slate-grey, edged with white; primaries blackish grey, the outer webs "frosted"; beneath white, passing round the hind neck.

Second year ♀ (July, Hambantota). Length 9.5 inches; wing 7.85; tail 2.85; tarsus 0.75; middle toe 0.7. Iris brown; bill black with a reddish tinge; legs and feet vinous brown; webs brown.

Lores and forehead white; a black spot in front of eye; crown, occiput, and nape blackish brown, some of the feathers faintly edged with white; ear-coverts black, continuous with the black of the crown, behind them the white of the neck encroaches on the dark colour; hind neck white, feathers at the lower part tipped with blackish brown; back and wings dusky slate-grey; upper tail-coverts paler; tail tinged with brown, the lateral feathers white, except at the tip; least wing-coverts dark brown; the median *very pale grey*; the greater and the secondaries brownish grey, inner webs of the primaries blackish grey. This individual, though it presents no appearance of a change to summer plumage, is evidently a full year old, although it is hard to say in what region or at what time of the year it was bred. An example, apparently of the same age, from Russia is acquiring the breeding-plumage.

Obs. This Tern can be distinguished in the immature stages from the last species by its smaller size (wing 7·8 inches against 8·5 in the quite young bird of *H. hybrida*), its slenderer bill, smaller legs and feet, and by the peculiar white patch or “*indentation*” behind the ear-coverts. From the young of the Black Tern it differs in the longer feet and toes and the paler upper tail-coverts. This latter Marsh-Tern (*H. nigra*, Linn.) differs from the subject of the present article in having the back and underparts in summer plumage dark sooty slate-colour, the head and hind neck only being black; the wing-coverts are slate-coloured, like the back, and the under wing greyish white instead of black. The feet and legs are smaller than those of *H. leucoptera*. Examples in my collection measure—wing 8·5 inches; bill at front 1·05 to 1·15.

Distribution.—This handsome Marsh-Tern has, singularly enough, proved itself a more frequent straggler to Ceylon than to India. It was added to the avifauna of the island by Mr. Holdsworth, who had the good fortune to meet with a pair in May 1866, flying about a small tank six miles from Aripu; one of these he procured, the specimen being now in the Colombo Museum. In October 1874 I saw an adult still in summer plumage in Koddigar (Kottiar) Bay, near Trincomalee; and in July of the previous year I obtained a small immature Marsh-Tern at Hambantota, which I could not identify at the time, but which, on comparison with specimens in Mr. Howard Saunders’s fine collection, turns out to be the young of this species.

In the ‘Ibis,’ 1870, p. 436, Mr. Hume added it to the Indian list, publishing a notice of a specimen shot in full plumage at Tipperah, in East Bengal, by Mr. V. Irwin; since that date, however, it does not appear to have occurred within Indian limits. That it should not occur more frequently in the Indo-tropical region is noteworthy, as it is diffused right across the continent of Asia (breeding in Turkestan) to Mongolia and China, where it is common, and southward of which it extends to the Malay archipelago, having been procured in Borneo and Celebes, and beyond which region again it must occasionally stray down the Australian coast, as Mr. Buller records an instance of a pair having been shot in the Province of Nelson on the Waihopai river in 1868; he also states that “it has been found in Australia of late.” In China Père David found it common on the sea-coast and about inland waters, and met with it in Mongolia in numerous flocks on passage in the month of August. Przevalsky found it breeding in abundance in the Lake-Hanka basin and at Lake Tsaidemin-nor, and noticed stragglers in Ala-shan. It must also breed in China, as there are specimens in full breeding-plumage in Swinhoe’s collection. Northwards it has been procured in Kamtehatka; and on the Amoor Schrenck obtained it in July 1855. It ranges as far north as Southern Siberia, Pallas having met with it on the Ob. It is more numerous in South-eastern Europe than in any other part of the world, inhabiting the shores of the Caspian Sea and the river Volga in great abundance. In Asia Minor it has not been met with; but Canon Tristram saw it in Palestine. It occurs in Cyprus and in the Epirus, and in summer is found in Hungary, breeding there as well as in Southern Germany. It strays into Northern Europe during the summer in small numbers, occurring rarely in Denmark, and having once been procured in Sweden. It is very rare in England, having been now and then procured on the east coast in summer, and on two occasions has strayed as far west as Ireland. In Northern France it is rare, but in the south it is common. In Italy, Sicily, Sardinia, and Malta it is seen in the spring; and in the Balearic Isles it is stated to breed. Mr. Saunders met with it rarely in Southern Spain, but found it common on the east coast at Valencia. It is not recorded from Morocco, or from anywhere except Gambia on the west coast of Africa; but it is not uncommon in South Africa, being recorded as such on freshwater lakes in Damara Land by Mr. Andersson, and about lagoons and marshes by Messrs. Buckley and Ayres in December and November. Returning to North Africa, we have Loche finding it breeding in Algeria, and Von Heuglin stating that it

nests in the delta of the Nile, and southwards along this river to Wady-Halfa. It has been obtained at Kordofan and on the Red Sea, and is a straggler to the Blue and White Nile.

It has once occurred in America at Wisconsin.

Habits.—Like the last species, this Marsh-Tern is generally met with about inland waters, about which it flies with a rapid, graceful, and buoyant flight, and feeds on insects, water-beetles, small fish, larvæ, and worms. It consorts in flocks sometimes of considerable number, and associates with the Marsh-Tern, which it exceeds, however, in the swiftness of its flight. The adult mentioned above passed my boat in Koddiyar Bay at great speed, the black under wing-coverts and white shoulders being very noticeable. It is said to perch on stakes and elevated objects, like the common Marsh-Tern. Von Heuglin observes that they are courageous birds, and do not ordinarily display much shyness; he found them feeding on flies, cockroaches, and other insects, and states that they are usually very fat. Naumann has observed them picking insects off the ears of grain.

Nidification.—This species breeds in marshes, building a nest of reeds and rushes on floating vegetation, and lays in May and June. Its eggs are usually three in number, but sometimes four. A series which I have had the pleasure of examining in Mr. Saunders's collection vary considerably in ground-colour, being buff, brownish buff, pale buff stone-, and pale stone-colour, with a slight olivaceous tint, and are somewhat pointed at the small end for Tern's eggs; they are very boldly blotched and clouded, some at the large end and some on the middle of the shell, with deep sepia or black-brown, and there are numerous smaller markings of the same, under which are the usual light blots of grey of different shades. Examples measure—1.34 by 1.0, 1.35 by 0.99, 1.37 by 1.01 inch.

Genus STERNA.

Bill varied as regards stoutness; typically long and straight, with the gonys straight and lengthened; in some stouter and slightly curved throughout. Tail much forked, the lateral feathers lengthened in the breeding-season. Feet generally more fully webbed than in *Hydrochelidon*.

Head changing to black in the summer.

STERNA SEENA.
(THE INDIAN RIVER-TERN.)

Sterna seena, Sykes, P. Z. S. 1834, p. 171; Saunders, P. Z. S. 1876, p. 645; Hume, Nests and Eggs, iii. p. 650 (1875); id. Str. Feath. 1878, p. 492 (B. of Tenass.), et 1879, p. 116 (List of Ind. B.).

Sterna aurantia, Gray & Hardw. Ill. Ind. Zool. i. pl. 69. fig. 2 (1832); Hume, Str. Feath. 1873, p. 281.

Sterna brevirostris, Gray & Hardw. *t. c.* fig. 1 (1832).

Seena aurantia (Hardw.), Blyth, Cat. B. Mus. A. S. B. p. 291 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 838 (1864); Holdsw. P. Z. S. 1872, p. 480.

The Large River-Tern, Jerdon; *Sykes's Tern* of some.

Adult female (Tenasserim). Length 16·75 inches; wing 10·9; tail 7·75; tarsus 0·85; bill to gape 2·38, at front 1·55.

Male (Godaveri). Wing 11·0 inches; tail 6·9, depth of fork 4·8; tarsus 0·8; bill at front 1·6.—“India,” *sea*? Wing 11·0; tail 6·8; tarsus 0·85; middle toe and claw 0·75; bill to gape 2·5.

The bill is stout and curved throughout in this species, resembling that of the Caspian Tern; lateral tail-feathers highly attenuated in the breeding-season.

Breeding-plumage. Iris brown; bill fine orange; legs and feet bright orange-red.

Female (Tenasserim). Head and nape intense black, with a greenish lustre, including the entire forehead and lores to the gape, and thence under the eye to above the ear-coverts; beneath the eye a white spot; hind neck, back, scapulars, wing-coverts, and tertials dark slate, paling on the rump and upper tail-coverts and central tail-feathers into bluish slate; three lateral pair of feathers white, tinged with grey; secondaries slate-grey; primaries grey on the inner webs, and “frosted” white on the outer, the coverts the same; chin round the gape and ear-coverts white, darkening imperceptibly on the fore neck, entire under surface, axillaries, and under wing into delicate grey, most pronounced on the lower breast; under tail-coverts white. Some examples are paler above than the one here noticed.

Winter plumage. Bill yellow, “dusky brown at the tip for half an inch” (*Butler*); legs and feet not so bright as in summer.

Forehead whitish, passing into grey on the head and occiput; round the eye a dark border, most prominent in front; “ear-coverts dusky blackish” (*Hume*). The black head is said by Mr. Hume to be worn until December; and as the bird breeds in March, the winter plumage must be doffed very shortly after it is assumed. In a specimen before me changing to breeding-dress, the new black feathers of the head are intermingled with those of winter, which are very plainly *dark* grey.

Young. Although this bird is so common in India, I have been unable to detect a specimen of the nestling in down in any collection in England.

The *immature bird* is figured by Hardwicke (*l. c.*), from whose plate I take the following description:—

Bill yellow, tipped with black; iris dark brown; legs and feet yellow.

Head fulvous brown, with blackish strise; ear-coverts and beneath and in front of the eye blackish; above slate-grey, the feathers of the hind neck and back tipped with blackish; the wing-coverts, scapulars, and tertials tipped and edged with buff, bordered internally with blackish; upper tail-coverts edged with dark grey.

Captain Beavan (*Ibis*, 1868, p. 403) says that the edgings to the feathers of the upper part are dark and wavy.

Obs. There seems to be little variation in the size of this Tern. Mr. Cripps furnishes the following data concerning a male shot in Furreedpore:—"Length 14.75 inches; expanse 31.0; wing 10.75; tail from vent 4.66; tarsus 0.83; bill from gape 2.46, at front 1.62; weight 5.25 oz. Irides dark brown; bill bright yellow; legs vermillion; mouth inside yellow." The peculiarly coloured legs will always serve to identify this species at once.

Distribution.—This River-Tern is said by Layard to be common in Ceylon. It may be, perhaps, a straggler to the island; but the statement that it is common is most certainly erroneous, and it is quite evident from Layard's words that he has been mistaken in his identification of the species. He says (*l. c.*):—" *Th. bengalensis* and *S. aurantia* pass in vast flights westward along the coral reefs on the north of Ceylon during the months of May and June." The latter is entirely a River-Tern, never frequenting the open coast; and the former, with which our bird is coupled, is a Sea-Tern, exclusively confined to the coast, and associating only with its larger relative, the Crested Sea-Tern, and another large species, the Gull-billed Tern. I was ever on the look-out for this species; and though I shot very many unfortunate examples of the bird called by Layard *Thalasseus bengalensis* (which is about the same size, and has a yellow-looking bill when on the wing), in the hopes of procuring a River-Tern, I did not succeed in getting one the whole time I was on the island, nor did I meet with any one who had ever shot it. As Layard informs me that all his birds were identified by Blyth, it follows, in all probability, that he procured it, and I therefore do not relegate it to the category of those species which have only been seen and not satisfactorily identified. It may occur as a straggler; but there are no favourable situations for it in the island, as it chiefly affects large rivers with sandy banks, and is a stationary species.

In India it is common on most of the large streams, and is also found about large tanks, whither it strays from its more accustomed haunts, the rivers of the peninsula. I am not aware that it is very common in Southern India; but the Rev. Dr. Fairbank records it from the rivers in the Deccan, and it is plentiful on the Mahanadi, Godaveri, and Koel rivers; and the other districts from which Mr. Ball notes it are the Rajmehal hills, Bardwan, Lohardugga, Orissa, Raipur, and Sambalpur. Its home, *par excellence*, is the Ganges and its many sandy-bedded affluents; and it follows the Hooghly down to its mouth. On the rivers of Furreedpore it is common and resident, breeding on the Brahmapootra; but in the streams of Cachar, further east, it is rare. In Lower Pegu it is abundant, frequenting the whole course of the Irrawaddy throughout the year. It is found on the Sittang, Salween, and other streams as far south as Moulmein, beyond which, in Tenasserim, it does not seem to have been observed. Turning westward, we find Mr. Hume recording it as fairly abundant in Sindhi on the Jhelum, Chenab, and Indus, right down to the sea, being even noticed in Kurrahee harbour, but it was not seen outside at sea; in all the large "broads" of the province of Sindh it abounds, says this author.

Habits.—As has been already noticed, this fine Tern is a dweller on rivers, and is said to hunt singly or in pairs, or in very small parties, following the course of the sacred Ganges and other mighty kindred streams, resting on their glistening sand banks when fatigued with its labours, and rearing its young in these glaring spots beneath the rays of a tropical sun. Its companion seems to be the remarkable Indian Skimmer (*Rhynchops albicollis*), which has never yet favoured Ceylon with its presence, but which spends its existence on the broad rivers of the mainland. After the manner of the inland group of Marsh-Terns, the present species, however, frequents also wheels and tanks, and must, in these spots, find an abundance of similar food to that partaken of by the latter-mentioned birds. Its flight is swift and well sustained, and its note is a shrill cry.

Nidification.—As early as the middle of March this species begins to lay on the Jumna and other rivers in the north of India; but on the Indus they do not, says Mr. Hume, lay until the second week in April. They nidificate on the churs or sand banks, and make no nest further than a small depression in the sand; and it would appear that occasionally they lay their eggs indiscriminately with those of other species, as Mr. Brooks informed Jerdon of such an instance having occurred on a sand bank in the Ganges. The nests are usually pretty close together, and are vigorously defended by the parent birds. Respecting their boldness, Mr. Hume writes:—"The vigorous manner in which these River-Terns attack and chase away Crows, Kites, and similar would-be robbers from the immediate neighbourhood of their nests is very noticeable. To me they seemed to

show more solicitude for their eggs than any of the other species breeding near them. It is impossible to doubt when they have eggs anywhere near; the way they flash backwards and forwards, and wheel round and round overhead, incessantly repeating their shrill plaintive cry, at once reveals the existence of the treasures they are so anxious to preserve." Regarding the incubation of the eggs, he writes that at the season when they lay "the bare white glittering sands on which the eggs are deposited are often at noon-tide too hot to touch; and accordingly, during the daytime, the birds seem to trust to the heat of the sun to hatch the eggs, and are rarely to be found on their nests; they pass the time wheeling round and round above, or snoozing beside them. By night every egg is covered by one or other of the parent birds; and when it is dark they sit so close that it is easy to catch them with a common butterfly-net." The eggs are usually three in number; and a series that I have examined in the collection of Mr. Howard Saunders are pale olivaceous stone-colour, some brown, others greener in tint; they vary in shape from long to broad ovals. The markings are moderately-sized blots and spots of dark red, purplish red, and red-brown, pretty evenly distributed over the surface of the shell, and mingled with blotches or small clouds of bluish grey and purple-grey underlying the dark markings. Dimensions of some examples in Mr. Saunders's collection are 1.67 by 1.17, 1.84 by 1.25, and 1.48 by 1.17 inch, showing that considerable variation in size exists.

STERNA MELANOASTRA.

(THE BLACK-BELLIED RIVER-TERN.)

Sterna melanogaster, Temm. Pl. Col. v. pl. 434 (1838); Gould, B. of Asia, pt. 19 (1867); Holdsw. P. Z. S. 1872, p. 481; Legge, Ibis, 1875, p. 407.

Sterna javanica, Horsf. *apud* Blyth, Cat. B. Mus. A. S. B. p. 292 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 840 (1865); Hume, Str. Feath. 1873, p. 282; id. Nests and Eggs, iii. p. 652 (1875).

Sterna melanogastra, Temm., Saunders, P. Z. S. 1876, p. 645; Hume, Str. Feath. 1878, p. 492 (B. of Tenass.), et 1879, p. 116 (List Ind. Birds).

Adult. (India) Wing 8·5 inches; tail 5·8, outer feathers 3·4 longer than middle pair; tarsus 0·42; middle toe 0·5; bill at front 1·45. (Futtehghurh) Wing 8·2; tail 5·8; tarsus 0·6; middle toe 0·5; bill at front 1·5; length 12 inches. (Jerdon.)

Summer plumage. Iris brown; bill orange-yellow; legs and feet pale clear yellow.

(Futtehghurh). Forehead, head, and nape black; lores almost all white, the black colour only occupying the space just in front of the eye; neck, back, and wings bluish grey; upper tail-coverts and tail paler bluish grey; outer web of the 1st primary and tips of the remainder dark grey, the outer webs of the remainder silvery greyish white; shafts white; face and throat white, passing into delicate grey on the chest, and thence gradually on the breast into the uniform black of the *belly, vent, and under tail-coverts*; flanks and axillaries pale blue-grey; under wing white.

Winter plumage (India). Bill yellow, tip blackish; legs and feet yellow.

Back and wings grey, paler than in summer; lores and forehead white; head and nape grey, striated with black, which behind the eyes becomes confluent and forms a patch.

The winter plumage is assumed, according to Mr. Hume, as late as the middle of December, as in the case of its larger relative, *S. seena*, and is doffed again in February and March.

I have been unable to examine a nestling of this Tern; nor am I acquainted with the immature plumage, which is, however, probably tipped above, as in other species, with brown and fulvous.

In this species and *S. seena* the bird of the second year is probably characterized by the usual dark feathers above the ulna.

Obs. Data as to size and weight are given by Mr. Cripps, in his 'List of the Birds of Furreedpore,' as follows:—
"Male. Length 12·7 inches; expanse 25·0; wing 8·75; tail from vent 5·5; tarsus 0·58; weight 2·5 oz. Iris brown; bill bright orange-yellow; legs dark orange-yellow."

Distribution.—This handsome little Tern, which is a very rare species, was never procured by me in Ceylon; and though I identified, in my paper "On the Birds of the South-eastern Subdivision of Ceylon" ('Ibis,' 1875), a species *seen* there with it, I am now pretty sure that I was mistaken, and that many, if not all, the dark-bellied birds I saw in the hot season were nothing but the Marsh-Tern, and those I met with in winter plumage and thought to be it were the Asiatic Little Tern, *S. sinensis*. Mr. Holdsworth writes that he has frequently seen it near Aripu, and occasionally at Colombo; but he informs me that he never procured it, and I am under the impression that many examples taken by him for it were the Marsh-Tern in summer plumage. Layard's remark concerning it is:—" *S. javanica* is common even on the lakes at Anaradhapura." This evidently applies to the Marsh-Tern, for though the present species is found straying about jheels and tanks in India, it is when they are in proximity to the large sandy-shored rivers on which it passes the most of its time: there are, however, none such in Ceylon; and I am convinced that such a small island, devoid of these rivers, is wholly unsuited to the habits of both this and the Larger River-Tern; but at the same time I am ready to admit that both *may* be occasional visitants to the island.

In India it frequents, like the last species, the large rivers, being found, according to Jerdon, on every one of them. In the Deccan, Messrs. Davidson and Wenden say that it is common on all the rivers, likewise breeding on them; and the same remark as to its general distribution in Chota Nagpur is made by Mr. Ball, who, in his valuable list of the Godaveri-Ganges region, notes it from Bardwan, Manbhum, Lohardugga, Sirguja, Sambalpur, and Orissa, while Mr. Hume has it from Raipur. On the Hooghly, Ganges, Jumna, and Brahmapootra it is resident and a common species; and on the streams of Furreedpore it is likewise abundant all the year round. It extends eastward into Burmah, being very numerous on the Irrawaddy, and breeding there in March. Southward, in Tenasserim, it is common on all the inland creeks and larger rivers of the northern half of the province. Captain Ramsay procured it at Tonghoo, and Mr. Davison on the Salween and Sittang rivers, and at Kedai-Keglay, Thatone, and Wimpong; but it is not recorded from anywhere south of Moulmein. Returning now to the north-west of India, we find Mr. Adam recording it from the Sambhur Lake in October, where he, however, only procured a single pair, so that it would seem to be a straggler to that district; it does not seem to have been noticed in Guzerat, but on the rivers of Sindh and the Punjab Mr. Hume states that he found it excessively common. It has occurred as a straggler during a tempest at the island of Réunion.

Habits.—This elegant little Tern is entirely a freshwater species, seldom frequenting any other localities but rivers, except where there are marshes and jheels in riverine districts, when it is found hunting about them, after the manner of Marsh-Terns. Its flight is said to be swift; and if my identifications of it on the wing in Ceylon have been correct, I have noticed that it is something like that of the small group of Terns, *S. minuta*, &c., to be noticed presently—that is, performed with quick regular beatings of the wings, adroitly turning or swerving from side to side as occasion offers. Its note, which it utters when flying round and round over its nest, is likened by Captain Burgess to the chirp of a Sparrow. It is a bird of bold disposition; for I observe that Mr. Hume found them resuming their positions near their eggs after having been disturbed, when he had only retreated some 30 or 40 yards from them. Its food consists of small fish, larvæ, and aquatic insects.

Nidification.—Like the last species, this little Tern breeds very early in the season, laying as early as the second week in March, at which time its eggs have been taken on the Jumna and the Irrawaddy. By the beginning of May all eggs are hatched off. No nest is made; but the eggs are merely deposited in shallow circular depressions in the sand, sometimes so near the water that they are damp. The eggs are usually three in number, never more; but sometimes two only are laid. They are glossless, and, according to Mr. Hume, are of various shades of cream- and buff-colour, marked usually with small specks, streaks, and spots, not thickly set, and occasionally with a few large blotches of reddish or purplish brown, under which are hazy spots, clouds, and streaks of pale purple. The average size of eleven eggs is given as 1.3 by 0.99 inch. Two specimens which I have examined, in the collection of Mr. Howard Saunders, are pale stone-grey and delicate greyish white in ground-colour: one is marked with purplish-brown blotches overlying handsome clouds of purplish grey, beneath which, again, are faint blots of bluish grey; the other is coloured with small straggly markings and specks of red-brown over small blots of purplish grey. They measure 1.18 by 0.91 and 1.27 by 0.96 inch.

STERNA CASPIA.

(THE CASPIAN TERN.)

Sterna caspia, Pall. Nov. Comm. Petrop. xiv. p. 582 (1769); Hume, Str. Feath. 1873, p. 280; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1434 (1873); Legge, Ibis, 1874, p. 3; Saunders, P. Z. S. 1876, p. 656; Dresser, B. of Eur. pt. 59, 60 (1877); Hume, Str. Feath. 1879, p. 115 (List of Ind. B.).

Sterna tschegrava, Lepechin, Nov. Comm. Petrop. xiv. p. 500 (1769).

Sylochelidon caspia (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 290 (1849); Kelaart, Prodromus, Cat. p. 137 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 835; Holdsw. P. Z. S. 1872, p. 480; Legge, Ibis, 1875, p. 407; David & Oust. Ois. de la Chine, p. 522 (1877).

Sylochelidon strenuus, Gould, P. Z. S. 1846, p. 21; id. B. of Austr. vii. pl. 22 (1848).

The Largest Tern, Jerdon; *Raub-Meerschwalbe*, German; *Reus Zeezwaluw*, Dutch. *Keykra*, Sindh (Hume).

Liniya, Sinhalese.

Adult male and female (Ceylon). Length 19·2 to 20·5 inches; wing 15·3 to 15·75, reaching to 2·5 beyond the tail; tail 5·0 to 5·8; tarsus 1·7 to 2·0; middle toe and claw 1·6 to 1·8; bill to gape 3·6 to 3·75; weight 1½ lb. The tail is not deeply forked in this species, the outer tail-feathers not much exceeding the adjacent pair.

Summer plumage. Iris dark brown; bill coral-red, dark brown close to the tip in some; the extreme tip yellowish; inside of the mouth orange-red; legs and feet black. The bill in this species is very stout and slightly curved. Forehead and most of lores, crown, and nape glossy black, passing underneath the eye and *above* the ear-coverts; hind neck and all the lower plumage, with the axillaries and under wing, pure white; back and wings very pale grey, paling almost to white on the upper tail-coverts and tail; primaries blackish grey, the outer webs entirely "frosted" with silvery white; secondaries grey, with the edges of the inner webs white.

Winter plumage (Ceylon). Bill not so bright as in summer, with the terminal portion dusky; feathers of the top of the head and nape black in the centre and white at the edges, leaving on the forehead a black mesial line only; upper part of the cheeks and the ear-coverts black; back darker grey than in summer, and the tail-feathers not so pointed as in summer. The plumage of the head varies, being in some birds blacker than in others, the forehead and lores in the latter being almost white. The black head-dress is put on in Ceylon early in March; about the 10th of that month I noticed that about one third of all the examples I met with at Jaffna were in the summer plumage. It is noteworthy that the ear-coverts in this species are black in winter and white in summer.

Nestling in down. Above white, tinged with buff; the down in most places dark-tipped; the scapulars with large spots of brown near the tips of the feathers; quills, which are just appearing, slaty, tipped with white; ear-coverts blackish. No conspicuous markings anywhere.

In first autumn plumage the scapulars and tertials and back-feathers are edged with pale fulvescent, with a dark cross bar; head much as in winter plumage, but the edgings dusky whitish; bill more tipped with black than in the adult in winter. A bird of the second year in my collection, dated November, has the feathers above the ulna dark grey, and the greater wing-coverts tinged with brownish; tail-feathers brownish grey.

Obs. A series which I have examined from S.E. Europe measure—wing 15·2 to 16·0 inches; tail 5·8 to 6·2; tarsus 1·7; bill to gape 3·0 to 3·7. Mr. Oates records the dimensions of a pair of male Burmese specimens as—length 20·0 to 20·2 inches; expanse 49·5; tail 5·4 to 5·5; wing 15·4 to 15·9; tarsus 1·68 to 1·78; bill from gape 3·7 to 3·85. In Europe the black head is doffed at the latter end of August. A specimen from the Dobrudscha, in Mr. Dresser's collection, shot on the 26th of that month, is beginning to acquire the winter dress. Gould separated the Australian bird on account of its alleged greater size and more massive form; but European specimens are quite as large as these southern birds.

Distribution.—This splendid Tern is more abundant on the Jaffna peninsula and in certain spots on the north-west coast than elsewhere in Ceylon. I met with it in the month of March in great numbers about the Jaffna Lake and the islands off the town. At Erinativoc Islands and on the Manaar flats it was also abundant; and in Calpenty Bay I saw large numbers. Southward of this it becomes rarer, and I have not seen it below Chilaw on this side of the island. On the other coast it is not uncommon about the salt lagoons and also on the open shore to the north of Trincomalie. On the Peria-kerretje Lake small flocks were seen by me; but it is nowhere so common in this part as at Jaffna. In the south-east of the island I have seen it in March in the Kirinde and Yāla district, but in the hot weather it was not observed. The majority leave Ceylon in April, and in October their numbers are again increased. Mr. Holdsworth has seen it throughout the year at Aripu. It has not been met with in the Malay archipelago, and therefore it is to be inferred that its migration is northerly along the Indian coasts; but as it is not recorded as a very abundant species in the Empire, its breeding-haunts may perhaps be nearer Ceylon than is supposed. Jerdon states that it is by no means uncommon in most parts, frequenting rivers, jheels, and tanks; but of late years the notices of its occurrence have been rather meagre, and relate chiefly to the sea-coast. It is not found on the Andamans or Nicobars; and in the Laccadives Mr. Hume did not see it. In Burmah it appears to be very rare, as Mr. Oates only saw a pair once in the Sittang. It appears to be rare on the Hooghly, as Mr. Hume has never seen it in the Calcutta bazaar, and I do not observe any record of its occurrence further inland on the Ganges or Jumna; moreover Mr. Hume remarks that it is almost unknown in the N.W. Provinces, Sindh, the Punjab, and Rajpootana, although it is occasionally seen on the Indus after its entrance into the province of Sindh; here, as elsewhere, it proves itself a lake-frequenting species, being very common on all the inland sheets of water, as many as fifty being seen at a time on the Muncher Lake. In Kurrachee harbour it is not uncommon; and specimens were seen by Mr. Hume on the Mekran coast and at Muscat. In Persia it is common on the Shiraz and Kázrún plains in winter, the same at Lenkorán in June, and on the Caspian abundant, breeding there. Severtzoff states that it breeds in the eastern and north-western provinces of Turkestan, including the sea of Aral, and an altitude on the Thian-shan mountains of 4000 feet. It will probably be found at Lake Balkash in Russian Turkestan; but further north in Siberia it is almost unknown, as the only place that it has been recorded from is near the mouth of the Dseja. It was not met with by Przevalsky; but in China it has been seen by Père David on lakes and streams in the interior. Swinhoe found it on the coast of the mainland in Formosa in winter, and in Hainan at Hoehow harbour in February and April. It is not found in the Philippines, and has not yet been recorded from the Malay archipelago. In Australia, however, it reappears, being found from Cape York down the east coast to Tasmania, being abundant in Bass's Straits, where it breeds in September and October. On the west coast it has not been noticed. Crossing over to Africa we find it, according to Layard, a summer visitor to the south of the continent, being not uncommon on the coasts; the same is said of Damara Land by Mr. Andersson. Up the east coast it is found at Mozambique, breeding on islands off the mouth of the Zambesi, and extending across to Madagascar, probably visiting also the Comoro Islands. It is resident in the Gulf of Aden and along the coasts of the Red Sea, as well as in Lower Egypt; but to the interior (the Blue and White Nile and the Kordofan district) it is, according to Von Heuglin, chiefly a winter visitor. It is found along the north coasts to Tangier chiefly in winter. On the western side it is recorded from Gambia, Sierra Leone, and the Gaboon. It is not common in Southern Spain, but breeds at the mouth of the Guadalquivir and near Cartagena on the S.E. coast. It is an occasional visitor to the French coast, and a rare straggler to the British isles, having occurred on the south and east coasts between the months of May and October inclusive. It is rare in Belgium, but more common in Denmark; and the late Mr. Durnford found a good many breeding in the island of Sylt, where, however, its numbers have greatly decreased within the last fifty years. In midsummer it ranges up the coast of Sweden to Tornea, at the head of the Gulf of Bothnia. It occurs irregularly on the coasts of Italy and in Malta and Sicily, but it breeds on islands on the Sardinian coast. It was observed on the coasts of Albania by Lord Lilford, has been met with in winter at Missolonghi, breeds in the marshes of the Dobrudscha, and is tolerably common on the Black Sea. It does not seem to wander across the south-eastern portion of the continent, as it has only once been recorded from Austria. It has been seen by Lord Lilford at Cyprus; and Canon Tristram obtained it in Palestine. Finally, turning our attention to the Nearctic region, we find it recorded by Professor Baird as occurring on the east coast of America in winter, as far south as New Jersey; and from Labrador through

the Hudson's-Bay waters it has found its way to the Great Slave Lake and the Mackenzie river, where Mr. B. Ross has procured it.

Habits.—This large Tern in its habits is intermediate between the Marsh- and River-Terns and those species which are exclusively found on the sea-coast. It is just as much a lake- as a shore-bird, and is particularly partial to brackish or salt lagoons near the coast, about which it may often be seen hunting quite alone or in distant companionship with one or more of its fellows, proceeding with steady powerful strokes of its long wings, which enable it to take stock of a pretty large "backwater" or lagoon in a very short time; it rarely comes back over the same ground again, as with its large bill *pointed downwards* it intently surveys the water beneath it, and is sure not to pass its prey, on which it descends with an unerring pounce. As Mr. Hume rightly observes in 'Stray Feathers,' it may be distinguished from other Terns by its habit of pointing its bill downwards; but when flying along the coast or sea-beach, and not intent on fishing, it carries its bill straight; and if the observer crouch down and keep perfectly still it will fly over him; should he, however, move it will invariably swerve off and keep out of gun-shot. Though unsociable while fishing, it collects in flocks on sand banks as the tide is just leaving them, all standing with their heads pointed the same way, and often in company with the Brown-headed Gull. While flying about it frequently utters its harsh loud note, which sounds like *krāke-krā*; and it has the peculiarity of flying off, uttering this note, after being shot at and wounded. I have invariably found it do this. Mr. Dresser states that it swims more than other Terns. I never saw it on the water myself, and am of opinion that it never takes to it unless under some peculiar circumstance. This author remarks that during breeding-time it will occasionally kill and devour young birds and steal eggs, after the manner of the larger Gulls. Its ordinary food, however, consists entirely of fish.

Nidification.—The Caspian Tern breeds in June, a number of pairs nesting together. Mr. Durnford, writing of the colony which he observed at the old-established breeding-place on Sylt, says:—"They lay their eggs on the bare sand, between the beach and the dunes, in a slight hollow about the size of an Oystercatcher's nest, occasionally lining it with a few pieces of shell." Mr. Dresser has found grass-bents in some nests and others without any lining at all. The eggs are usually three in number, but sometimes only two; and according to Naumann while they are being hatched the male bird displays the utmost anxiety for their safety, but afterwards when the young are out he leaves the task of defending them to the female. The eggs vary in size and shape, some being almost perfect ovals, slightly pointed at the small end; others long and somewhat compressed throughout the smaller half; but the usual shape seems to be a moderately broad oval, pointed a little at one end. The ground-colour is pale stone-grey or very pale brownish stone; the shell is slightly rough and has a moderate gloss; and the markings are normally small for the size of the eggs, consisting of dark umber-brown irregular blotches of uniform size, distributed throughout the shell on some eggs, whilst in other specimens they are larger at the obtuse end; these are mingled with smaller specks and scratches of the same hue over numerous primary or underlying markings of blue-grey, in the form of large blotches in some, and of small specks in other eggs. One example in the series before me, possessed by Mr. Dresser and collected in Sweden and Lapland, has large, blackish, irregular, partly-washed-out clouds here and there, the whole surface of the shell being openly "dusted," as it were, with small dark specks over larger blotches of the same colour as the clouds; the underlying markings are bluish grey and light umber-brown. The measurements of several specimens are—2.4 by 1.67, 2.35 by 1.74, 2.36 by 1.71, 2.65 by 1.74, and 2.55 by 1.83 inch.

STERNA ANGLICA.

(THE GULL-BILLED TERN.)

Sterna anglica, Montagu, Orn. Dict. Suppl. (1813); Saunders, P. Z. S. 1876, p. 644; Dresser, B. of Eur. pts. 61, 62 (1877); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1425 (1873); Hume, Str. Feath. 1879, p. 115 (List Ind. B.).

Sterna aranea, Wilson, Am. Orn. viii. p. 143 (1814).

Sterna affinis, Horsf. Trans. Linn. Soc. 1821, xiii. p. 199.

Gelochelidon anglica (Mont.), Kelaart, Prodrum, Cat. p. 137 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 836 (1864); Holdsw. P. Z. S. 1872, p. 480; Legge, Ibis, 1874, p. 33, et 1875, p. 407; Salvadori, Uccelli di Born. p. 371 (1874); Hume, Str. Feath. 1878 (B. of Tenass.), p. 491.

Gelochelidon macrotarsa, Gould, B. of Austr. Suppl. pl. 81 (1869).

Sterna nilotica, Hasselq. *apud* Hume, Nests and Eggs, iii. p. 648 (1875).

Lach-Zeezwaluw, Dutch. *Kādal kuruvi*, Ceylonese Tamils, also *Pullu* (Layard); *Simbangan*, Borneo (Mottley).

Liniya, Sinhalese.

Adult male (Ceylon). Length 14·6 to 15·5 inches; wing 12·5 to 13·0, reaching 2·0 beyond tail; tail 4·7 to 5·8 (attaining its greatest length in the breeding-season); tarsus 1·3 to 1·4; middle toe and claw 1·2 to 1·3; bill to gape 2·0 to 2·15, at front 1·5 to 1·6.

Female (Ceylon). Length 14·3 to 15·0 inches; wing 12·0 to 12·4; tarsus 1·3; bill to gape 2·0 to 2·1, at front 1·4 to 1·5.

The bill is short and high at the base in this species, with the gonys much pronounced.

Breeding-plumage (Ceylon, March). Iris hazel-brown; bill black, with a reddish tinge, the gape and inside of mouth pale red; the base of the lower mandible reddish occasionally; legs and feet black, with a slight tinge of reddish. Forehead, including the upper half of lores, head, and nape, with a nuchal crest $1\frac{1}{2}$ inch long, glossy black; lower part of the lores in a line with the nostril, face, sides of neck, and all beneath, including the under wing, axillaries, and under tail-coverts, pure white; back and wings pale blue-grey, fading into silvery greyish on the tail; quills silvery grey, terminal margins of inner webs dark grey, and the bases white; primary-shafts white. After a while, as in other species, the primaries lose the "frosting" and become dark grey. In one specimen some of the head-feathers are black, with white edges, which, in course of time, probably would turn black, proving that in this case a moult and change of colour are combined in producing the black head. This plumage is assumed in March in Ceylon.

Winter plumage (Ceylon). Bill pure black, the gape not red; legs and feet pure black.

Forehead and front of crown white, becoming gradually dusky bluish grey on the occiput and nape, on which latter the shafts are also dusky; a black spot in front of eye, in general passing round it, and spreading over the ear-coverts as a blackish patch; lores and front part of cheek striated with black. The extent of black on the auricular region is variable.

Nestling in down. "Head greyish white on the hind crown, and nape marked with a few small grey spots; a larger spot on the ear and a mark carried from the end of the gape under the cheek, both blackish grey; upper parts light grey, darker in shade than the nape and hind crown, marked with blackish-grey spots, which run into stripes, of which the four central ones are the most clearly defined; chin, throat, and underparts pure white, except the fore part of the neck, which is greyish white; bill short, pale reddish at the base, greyish in the middle, and white at the tip; iris brownish grey; feet dull reddish white." (Dresser, fide Naumann).

1st plumage (Mus. Saunders). Head grey, tinged with tawny rufescent, and the feathers with black stripes; hind neck white; back, scapulars, and wings grey, with the feathers of the interscapular region tawny rufescent, with black shaft-lines; the tertials rufescent at the tips, and with black drop-shaped marks near the tips; tail very pale grey, with subterminal spots of blackish, and a tinge of yellowish rufescent at the tip; quills as in the adult.

Bill fleshy reddish; legs and feet brown.

A Ceylonese example shot at the end of September has acquired the bluish feathers of the upper surface and wing-coverts, and there is no dark bar along the ulna, the lesser coverts being concolorous with the greater; the tertials have black-brown patches near the tips, and edgings and indentations of fulvous buff; the tail-feathers have blackish-grey patches near the tips, with similar coloured margins to the tertials; the crown, occiput, and nape have brown mesial stripes; the loreal streaks, patches in front of the eyes and on the ear-coverts are much the same as in the adult, but the latter are of a brownish hue; the primary shafts from the 3rd inwards are sullied with brown, the first three only being pure white. After the moulting of the dark-marked feathers here noticed there would be little or no sign of the young plumage in the following spring. A single new tertial feather among the dark-marked abraded ones has a small blackish shaft-stripe near the tip; and this, together with the dark primary shafts, would be the only signs of adolescent plumage in the wings.

Obs. There appears to be a noticeable difference in the size of the males and females in this species, which I do not find to be the case in all species, though it is commonly maintained that the female in this family is always the smaller. In the present bird there is also considerable individual variation. This difference is very perceptible in the feet and legs, and caused Gould to separate Australian specimens he obtained, which happened to be large, as a distinct species, *S. macrotarsa*. The American form, again, named by Wilson *S. aranea*, is identical with the Asiatic bird. An example in summer plumage, before me, corresponds, as regards the coloration of the upper surface, with Ceylonese specimens, and measures as follows:—wing 11·8 inches; tail 4·5; tarsus 1·15; bill at front 1·5. A European specimen measures:—wing 12·5 inches; tail 4·6; tarsus 1·35; middle toe, without claw, 0·9; bill to gape 2·2.

Distribution.—This well-known Tern is one of the most abundant species of its family in Ceylon, for though it is not so common on the west coast from Negombo down to Galle and Tangalla as the two Crested Terns, it is very numerous round the whole sea-board of the east and north of Ceylon, commencing at Hambantota, thence up to Jaffna, and down to Manaar and Kalpitiya (Calpentyn) Bay on the west. On the south coast it is to be found in tolerable numbers in June, July, and August, as well as during the north-east monsoon; but all the specimens I saw at the former period, and which were chiefly frequenting the salt lagoons and marshes near the coast, were in winter plumage, and were evidently non-breeding birds. In the Trincomalie district it is plentiful at the beginning of September, and I noticed some birds still in breeding-plumage, from which I infer that it may perhaps nest in the island. In the Jaffna peninsula it is a very abundant species, frequenting the lakes and the islands to the westward of the mainland, as well as the lagoons in the interior, where it consorts with the Marsh-Tern. Down the west coast as far as Manaar it is equally plentiful, and it occurs again abundantly in Calpentyn Bay; but southward of this point its numbers decrease, and it is uncommon about Colombo. Though found about inundated paddy-fields in the maritime regions, it does not stray far inland, except where there are large tanks at no great distance from the sea, such as Kanthelai or the Giants' tank near Manaar.

Though an abundant species in India, it does not frequent the islands on either side of the peninsula except as a straggler, not having been seen on the Laccadives, and only once having been recorded from the Andamans, where Capt. Wimberley procured it in November. Jerdon states that it is found in marshes, tanks, and rivers in the interior; but it appears that this applies *chiefly* to districts on the sea-board. In the Deccan it is rare, a few remaining in the summer; at Bombay it is very common, and it is presumably so on the eastern side of the peninsula, as Mr. Ball states that it is found on tidal rivers in the Godaveri-Ganges district. It is common further north about Calcutta and in Furreedpore; and on the eastern side of the Bay Dr. Armstrong found it the same in the Irrawaddy delta, whence it extends along the coast as far south as Mergui, frequenting creeks and the sea-coast as well. Towards the west of India, we find it common in jheels, lakes, and large rivers in Guzerat, Cutch, Kattiawar, and Jodhpoor. In Sindh it does not appear to be widely spread, as the only places in which Mr. Hume met with it abundantly were the Muncher Lake and Kurrachee harbour. It is a winter visitor to the North-west Provinces; but in the Punjab some remain to breed, as

Mr. Hume took the eggs on the Chenab. It inhabits Central Asia, but does not range far north in Siberia, as I only find Radde recording it from the Tarei-nor. It breeds in Turkestan, and is common in that country, according to Severtzoff. Further east, it inhabits Mongolia, the district of Ordos, and the province of Ala-shan, breeding in the Hoang-ho valley and in Southern Ala-shan. In China it appears to be rare: Père David supposes that he saw it in North China; and Swinhoe does not record it, although Mr. Saunders possesses a specimen subsequently procured by the latter at Amoy. In the Malay archipelago it has been obtained in Java, Borneo (Banjermassing), and Halmahera, while on the shores of Australia it is occasionally met with. Mr. Gould records it from Moreton Bay and from the Victoria River, North-west Australia; and Mr. Ramsay notes it in his catalogue from Rockingham Bay, Wide Bay, Clarence River, and New South Wales. Returning now to Western Asia, I find Canon Tristram recording it from Palestine, where he met with it near Beyrout; and Dr. Krüper observed it in Asia Minor, finding it breeding near Smyrna.

In Europe it is common in Greece, breeding in abundance in Missolonghi. It is found in Turkey, frequenting rivers and lakes in Bessarabia; it occurs in Transylvania, and has been obtained on the Neusiedler Lake, in Hungary. It has been met with in Malta and Gozo, as also in Sardinia, whilst in Sicily it is common. In Italy, writes Count Salvadori, it is a spring visitor, and then not abundant. In summer it extends through Germany to the shores of the Baltic, where it is rare; but in Denmark it breeds, though not now so numerously as in former years. It does not range as far north as Scandinavia, according to Mr. Dresser, nor is it found in Finland or in Northern Russia. To Great Britain it is a rare straggler, having visited only the southern and eastern coasts. In Holland and France it is only an occasional visitant, occurring in the latter chiefly on passage. It is recorded from Portugal; and in Southern Spain it is, according to Mr. Saunders, abundant in the marisma, breeding at the "mouth of the Guadalquivir and many other places." Col. Irby did not notice it about Gibraltar, but found it on the African side of the Straits in great numbers at the Ras-Dowra lakes. Canon Tristram likewise met with it in flocks in the Western and Eastern Sahara, and found it breeding at Zana. It is abundant in Algeria and in Egypt, breeding in both countries, in the latter resorting for this purpose to the lagoons of Lower Egypt. Von Heuglin states that it extends southwards to the Blue and White Nile and the swamps of Kordofan, but occurs in the southern districts only from August until March. In Abyssinia it was observed during the latter month; and on the shores of the Red Sea it was also observed in winter only. It does not range into South Africa, nor is it found on the west coast; but on the other side of the Atlantic it extends from the United States down the whole east coast, including Cuba, to Patagonia, where Darwin procured it. Dresser found it common in Texas, and Mr. Salvin in Guatemala, the only locality on the west coast where it has been seen. From Brazil Messrs. Selater and Salvin record it.

Habits.—This widely-distributed Tern is, on the whole, more partial to fresh and brackish water than to the open coast. It frequents lagoons, estuaries, rivers, freshwater lakes, tanks, and flooded paddy-fields, and in these resorts is not unfrequently seen in Ceylon with the Marsh-Tern. It is conspicuous for the great proportionate length of its wings, which furnish it with considerable powers of flight, its movements being rapid, buoyant, and graceful. Its wings are not rapidly plied, but steadily, at a moderate rate, the length of the stroke carrying it through the air at a considerable speed. When met with on the salt lagoons of Ceylon several are generally not far from one another, coursing over their surface, and careering backwards and forwards in search of their prey. Sometimes a considerable number associate together; and at Trincomalie I have seen a large flock, together with the Small Crested Tern, hovering round the lengthy sein-nets which were being drawn to shore by the fishermen. It has a very peculiar note or laugh, which comes upon the ear with startling suddenness, and which Col. Irby not inaptly likens to *küh-wük, küh-wük*: this it often repeats several times, and then relapses into silence, not constantly uttering its call like the Crested Terns. It has another singular note, like *chē-āh*, which I have noticed more in the summer season than in the winter, and which I accordingly take to be its call-note. Its diet is somewhat varied; in Ceylon I have found it to consist of frogs, crabs, and fish; the two former are picked to pieces while being eaten. In Egypt Von Heuglin has seen it darting into the smoke of a prairie fire in pursuit of locusts; and he found it generally feeding on beetles, butterflies, &c. In Algeria Mr. Salvin noticed much the same thing, seeing it hovering over grass-fields, and descending upon grasshoppers and beetles. When pouncing upon fish it descends with a rapid swoop, but does not immerse itself in the water.

Nidification.—The only record we have of the Gull-billed Tern breeding within Indian limits is that of Mr. Hume in 'Nests and Eggs,' relating to some eggs which he found in the Punjab on a sand bank of the river Chenab. I believe that it may perhaps breed in Ceylon, and the discovery of its eggs in the island is much to be desired. It usually lays its eggs on sand or on the bare earth, scratching a hole and lining it scantily with seaweed or grass; such nests Mr. Seebohm found in Asia Minor and Greece; but Mr. Dresser detected many in America which were mere holes in the sand. Mr. Hume describes the nest he found as a depression in a tiny sand mound, crowned by a dwarf bush. This was in April; but in Europe the breeding-time is in May and June. Two or three eggs are laid in the latter region; but in America, according to Mr. Dresser, four are sometimes found. The eggs of this Tern vary considerably in ground-colour, which ranges from pale olive to brownish olive, olivaceous stone, and greyish white. Some are almost perfect ovals, others pointed at the smaller end, and some are very broad; the texture is a little rough; the markings are moderately-sized spots of dull brown, scattered pretty evenly over the whole egg, and overlying light olive-brown blotches, beneath which, again, are bluish-grey spots and clouds. A series of five specimens of the American form are on the whole whiter than a number of the Old-World race; the blotches are rather larger and darker, as also the bluish-grey clouds; but there is the same *general* character in both. The dimensions of several, taken from a large series in Mr. Dresser's collection, are:—1.93 by 1.32, 2.02 by 1.37, 1.89 by 1.34, 1.92 by 1.35, 1.96 by 1.26, 1.82 by 1.32 inch.

In a large series taken by Mr. Seebohm at Smyrna the prevailing tints are two—brownish buff and pale stony-grey or greyish white. The latter are in some instances marked with large clouds of brownish red, softening occasionally into purplish brown, and mingled with underlying blotches of purplish grey. Measurements, to show the variation in shape, are:—1.83 by 1.38, 2.0 by 1.25, 1.72 by 1.39, and 1.79 by 1.34 inch.

STERNA FLUVIATILIS.

(THE COMMON TERN.)

Sterna fluviatilis, Naum. Isis, 1819, p. 1847-48; Sharpe & Dresser, B. of Eur. pt. 8 (1871);
Saunders, P. Z. S. 1876, p. 649; Scully, Str. Feath. 1876, p. 203; David & Oust. Ois.
de la Chine, p. 525 (1877); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Sterna hirundo, Linn. *apud* Blyth, Cat. B. Mus. A. S. B. p. 292 (1849); Jerdon, B. of Ind.
iii. p. 839 (1864) (*errore nirundo*).

Sterna senegalensis, Sw. B. of W. Africa, ii. p. 250 (1837).

Sterna wilsoni, Bonap. Comp. List, p. 61 (1838).

Sterna gracilis, Gould, *apud* Legge, Str. Feath. 1875, p. 376.

Hirondelle de mer, Pierre-Garin, Buffon; *Sea-Swallow*, Picket, *Spurre*, *Gull-teaser*, pop. in
England; *Andorhina do Mar*, Portuguese. *Balakchi*, lit. "the Fisher," Turki (Scully).

Adult male (N. America). Wing 10·3 inches; tail 5·1 (depth of fork 2·4), outer feather 1·0 longer than the penultimate; tarsus 0·81; middle toe 0·7, its claw (straight) 0·3; bill to gape 1·95, at front 1·5. "Length 14·0: weight 3·7 oz." (Scully, Yarkand).

"*Females*. Length 13·5 to 14·1 inches; wing 10·5 to 10·6, expanse 30·5 to 32·0; tail 5·4 to 5·9; tarsus 0·75 to 0·85; bill from gape 1·85 to 2·0: weight 3·6 to 4·4 oz." (Scully.)

Breeding-plumage (N. America). Iris brown; bill coral-red, the tip of the upper mandible blackish as far back as the gony-angle of the lower; extreme tip of lower mandible dusky; legs and feet coral-red, claws black.

Head, nape, and forehead with the lores to the level of the lower edge of the eye black; lower part of the lores, face, ear-coverts, and upper throat pure white, passing imperceptibly on the fore neck into the very pale greyish of the under surface, which changes again on the abdomen and under tail-coverts into pure white; hind neck, back, scapulars, and wings pale bluish grey, lightest on the hind neck; upper tail-coverts and central tail-feathers pure white, remainder tinged with light grey on the outer webs, those of the outermost feathers being much darker than the rest; secondaries and two inner primaries tipped with white; primaries dark grey, the 1st with the inner part of the inner web white, the next four, as in other species, with the white running out in a point into the dark colour of the tips; the outer webs and those of the primary coverts "frosted" with silvery greyish.

The under surface appears occasionally to be pure white.

Winter plumage. Bill black, tinged with reddish at the gape.

(Cape of Good Hope.) Back as in summer; head with the forehead and anterior portion of lores white; under surface white.

Young: nestling (Romney Marsh: Mus. Saunders). Head and upper surface warm creamy buff; throat blackish, sharply defined against the white under surface; crown marked with three lines of black spots; hind neck and back patched with black down the centre; wings with black spots; a group of blackish spots on the side of the rump, where the ground-colour is paler than on the back. Legs and bill yellow, the latter tipped with black, and measuring 0·43 inch at front.

In first plumage. The forehead and front of the crown with the anterior portion of the lores are white, the top of the head, occiput, and nape blackish brown, descending to the cheeks behind the eye, and passing round in front of it; hind neck white; back brownish grey, the feathers tipped with white, and marked with irregular pencillings of brown near the margins.

Immature (2nd year?) (October till April, Trincomalie). Iris brown; bill reddish black, reddish at the base of the lower mandible, extreme tip pale; gape and palate red; legs and feet dusky orange. In one April specimen the

legs and feet are orange, and in all the webs are lighter than the tarsus. Two examples shot in June: *bill blacker* than in April, with little orange at the gape; tarsus dusky brownish, mingled with yellow.

Length 12.5 to 13.6 inches; wings (all abraded) 9.5 to 10.2; tail 4.6 to 5.2, depth of fork 2.0 to 2.2, outer feathers 1.0 longer than the penultimate; tarsus 0.7 to 0.8; middle toe 0.7, its claw (straight) 0.3; bill at front 1.2 to 1.30, to gape 1.7 to 1.85.

In all these specimens (seven) the forehead and lores are pure white, becoming gradually mixed with blackish on the crown; the occiput, nape, and sides of the head behind the eye brown-black, with also a black edging in front of the eye; a dark-brown band along the ulna; back blue-grey in some, mixed with brownish-tipped feathers, the remains of the last season's plumage; the tails which are in new feathers in the April specimens, have the outer webs dark grey, paling successively towards the centre, the tips white; the central tail-feathers, the coverts, and rump are *blue-grey, paler than the back*; under surface and hind neck pure white.

Obs. An example from Cayenne measures as follows—wing 10.6 inches, tail 5.5, tarsus 0.73, middle toe 0.7, bill to gape 1.9; one from the Cape—wing 10.7, tail 5.7, bill to gape 1.9. I have given Dr. Scully's measurements of Yarkand examples above. An example among the immature birds here described was identified by Mr. Howard Saunders as the Common Tern; and since my return to England this gentleman has not altered his opinion. I have compared my series with examples of the Common Tern from various collections, and they appear to assimilate better with that species than with any other; but there remains the curious fact of the bills becoming blacker towards the summer instead of redder; the June examples, which had blacker bills and darker legs than the April, had, however, not begun to acquire the black cap, though the tail-feathers and primaries, except the first two (which in all Terns are the last to be shed), had been newly acquired. The assumption of the black bill in the summer points to a connection with *S. longipennis*, Nordmann, a North-east Asian species, which Mr. Hume says is found on the coasts of India. It is to be hoped that mature examples will be procured in Ceylon at a future period, and more light thrown upon the identity of the species. In none of my specimens is the gony as long as in the above examples from America. Two examples of *S. longipennis* from Kamtschatka, in Mr. Saunders's collection, measure as follows:—wing 11.0 to 11.2; tail 6.5 to 6.8; tarsus 0.8; bill to gape 1.9. The bills are black, palish at the base beneath, and the forehead, head, and nape are black. It is a slenderer bird than the Common Tern.

Mr. Saunders has lately (P. Z. S. 1876, p. 649) described an allied species to the Common Tern from Thibet and Lake Baikal, under the name of *Sterna tibetana*. It resembles the former to a great extent, differing "in having the sides of the neck, shoulders, and flanks clear grey, which assumes a darker and more vinous tint on the breast and abdomen; the mantle and wings are also much darker;" bill and feet as in the Common Tern.

The Arctic Tern (*S. macrura*, Naum.), which has often been confounded with the present species, has the bill entirely red in the summer, the tarsus much shorter, not exceeding 0.55 inch, and the tail reaches beyond the closed wings.

Distribution.—A specimen of the Common Tern was sent to the Calcutta Museum by R. Templeton, Esq., in 1846, and since that time until 1875 no record of its occurrence in the island was published, both Layard and Holdsworth omitting to notice it in their lists. In October 1874 I met with a number in Kottiar Bay, near Trincomalee, and secured specimens. I did not notice it then until the height of the nesting-season, when great numbers, mixed with the Gull-billed and some Crested Terns, used to frequent the bays on each side of the Fort, and live on the sardines which swarmed in shallow water near the beach. They disappeared in June, about the time that large flocks of the Roscate Tern passed over that part of the coast; but the following season they were again about the port; but I never saw them inside the harbour. In March 1876 I think I identified it on the wing in Jaffna Lake, but procured no specimens. From all accounts it seems to be rare in India; for though Dr. Adams informed Jerdon that it was common on the Indus, rivers of the Punjab, and lakes of Cashmere, Mr. Hume never once saw it in his tour through Sindh and exploration of the Indus. Jerdon states that it is rare in South and Central India, having only been seen by him from the lake at Ootacamund; but no one else has met with it since. In Kashgharia Dr. Scully found it abundant, arriving there in April, breeding in April, and leaving again in September. It occurs to the eastward in China, on the rivers of the interior, according to Père David; and Swinhoe met with it at Hankow on the Yang-tse-kiang. It does not appear to range northward into Siberia, being there replaced by *S. tibetana*. From Turkestan, in the eastern portion of which it breeds, according to Severtzoff, it ranges into Asia Minor, through Persia, and is found on the Caspian Sea and on the Black Sea, Sea of Marmora, and Bosphorus, arriving in these waters in April, and probably breeding there. It likewise occurs in the Mediterranean islands, and on

the coasts of Sicily and Italy in the spring, remaining in Sardinia throughout the summer. It breeds in Transylvania, and is found northward to the Baltic sea, remaining on the Rhine from May until August. In Denmark it is abundant, and it follows the coasts of Sweden to Uleåborg at the head of the Gulf, where Mr. Dresser found it abundant. Along the coasts of Norway it is distributed as far north as Lofoten; and it has occurred once in Iceland, though not in the Faroes or in Shetland. It is abundant in Holland in the breeding-season, and is a regular summer visitant to England, Ireland, and Scotland, breeding at Duncness, Ramsay Island, and the Farne Islands, Foulney Island, and on Strangford Lough. In France it is common, breeding in Picardy and on the Loire. In Spain it is abundant, and breeds on the coast on the Mar Menor, which Mr. Saunders considers as its southern breeding-limit. It likewise occurs in Portugal, and extends to the Atlantic isles, breeding in the Azores, the Canaries, and Madeira. Along the north coast of Africa it is found from Morocco to Egypt, where it occurs in winter and spring. Von Heuglin says it is seen throughout the year in the delta; but he never noticed it on the Red Sea. It extends to the Cape of Good Hope, most probably by the way of the west coast, as it has been recorded from Senegambia. Layard found it at all times of the year at the Cape, and Mr. Gurney mentions an instance of its occurrence in Natal.

Finally, in America it is found all down the Atlantic coasts from Labrador to Texas in spring and autumn, collecting in the latter place in summer, and breeding on the islands in Galveston Bay.

Habits.—This well-known Tern has much the same mode of living as the Gull-billed Tern, frequenting bays, harbours, estuaries, backwaters, and likewise lakes and rivers far inland. It is active and buoyant on the wing, and associates in moderately-sized flocks, which fish in close company with other species; and while following a "school" of fish, or hovering over and plunging into a school of sardines or other small fry, it is, like the Crested Terns, very noisy, continually giving out its note as it plunges headlong into the living mass, and in its excitement scarcely waits to swallow its prey before darting again into the water. They are fond of flying about the bars of rivers on the watch for fish crossing the shoal water; and a favourite spot at Trincomalie for them, as well as for other species, was the corner of Back Bay and the north side of the Fort, for here the sardines collected in enormous shoals, and furnished them abundance of food. When the strong south-west winds set in in April, *blowing off* the land, these and other Terns used to appear in greater numbers than at other times. It is not at all shy, pouncing on fish close to a boat, or near people who may happen to be bathing or fishing. When hovering over fish (which they are much in the habit of doing) they give utterance to a metallic-sounding *twink*, by which I could always identify them at no little distance. This piping note is quite different from that of any other Tern frequenting Ceylonese waters. In an interesting account given by Macgillivray of their habits in Great Britain, this author attributes an inquisitive propensity to them, such as is very noticeable in the Gull-billed Tern. He says, "When walking along the sandy shore, no bird nearer, perhaps, than a quarter of a mile, you may see one or two of them coming up from a distance, increasing their cries as they approach, then wheeling and plunging over and around you, and at length flying off." He likewise asserts that they often alight on the water and swim a little; but this I have never seen them do. When tired of fishing in Ceylon they rest on the sea-beach in little groups of three or four. I have found their food to consist entirely of fish; but they are said to eat sand-eels, small crustaceans, &c. Mr. Gurney, jun., gives an interesting account, communicated to Messrs. Sharpe and Dresser, of a pair of these Terns which were tamed by a taxidermist at Stockton-on-Tees, and which used to come to his call or whistle as they flew about his house.

Nidification.—The Common Tern breeds in May and June, either making an apology for a nest in the shape of a little depression lined with a few dry grasses, or laying its eggs upon dry drift grass or salt marsh. In sand, Macgillivray says that they make a depression without any lining; and the situations they generally choose are sandy tracts or pebbly ridges on the shore, rocky ground, or sometimes low rocks. The eggs are usually three in number, and are of a dull clay-buff, olivaceous stone, pale greenish, and brownish-buff ground-colour, and in shape are pointed ovals, well rounded at the obtuse end. One specimen in the series before me, in the possession of Mr. Dresser, is uniform dull white, and measures only 1.56 by 1.12 inch. The markings in general consist of large blotches of deep (blackish) sepia, which, on the boldest-coloured, are chiefly collected

round the obtuse end; these are mingled with light brown spots and blotches, beneath which are the usual bluish-grey and purple clouds. The dark markings are, as a rule, somewhat regular-edged. The dimensions of several are 1.67 by 1.23, 1.79 by 1.23, 1.73 by 1.22, and 1.65 by 1.21 inch.

Some eggs are richly clouded with red-brown, running in an oblique direction across the shell; and one specimen, in a large series collected by Mr. Seebohm, has a zone of hieroglyphic blotches at some distance from the obtuse end, mingled with blots of bluish grey, the rest of the egg being almost devoid of markings. Two opposite extremes in size in this series are 1.81 by 1.09 and 1.55 by 1.19 inch.

STERNA SINENSIS.
(THE WHITE-SHAFTED TERNLET.)

Sterna sinensis, Gm. Syst. Nat. i. p. 608 (1788), ex "Latham"; Saunders, P. Z. S. 1876, p. 662; Hume, Str. Feath. 1879, p. 116 (List Ind. B.).

Sterna minuta, Linn., Horsf. Trans. Linn. Soc. 1821, xiii. p. 198.

Sternula minuta (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 292 (1849, in part); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 840 (1864, in part).

Sternula sinensis (Gm.), Swinhoe, Ibis, 1863, p. 430; id. P. Z. S. 1871, p. 422; Holdsw. P. Z. S. 1872, p. 481; Legge, P. Z. S. 1875, p. 377; id. Str. Feath. 1875, p. 377, e 1876, p. 246; id. Ibis, 1875, p. 407; David & Oust. Ois. de la Chine, p. 527 (1877).

Sternula placens, Gould, Ann. & Mag. Nat. Hist. 1871, viii. p. 192; id. B. of N. Guinea, pt. iii. pl. 7 (1876).

Chinese Tern, Latham; *The Lesser Indian Tern* of some.

Characteristics. *Stout, black-tipped yellow bill; long tail, deeply forked; whitish rump and tail; 1st two quills black, the 1st with a white shaft, the 2nd with a pale shaft, having a white streak along the centre; primary-coverts pale grey.*

Adult male and female (summer, Ceylon). Length 9·2 to 10·5 inches, according to length of outer tail-feathers; wing 6·8 to 7·3; tail (in perfect specimens) 4·0 to 4·3, outer tail-feather 1·6 longer than the adjacent, and 2·2 longer than the central pair; tarsus 0·65 to 0·7; middle toe 0·53 to 0·56, claw (straight) 0·45; bill at front 1·2 to 1·3. Lateral tail-feathers much attenuated. Females are slightly smaller than males.

Iris hazel-brown; bill gamboge-yellow, sometimes without a dark tip, but generally with more or less of the tips of both mandibles, for a distance of 0·35 inch, black; legs and feet orange-yellow. In some females the legs are dusky orange.

Summer plumage (Minery). Crown, occiput, nape and its sides, down to the level of the lower edge of the eye, as also a broad band from the nostril-membrane to the eye, black; forehead white, passing in a point above the eye to about its centre; mantle, scapulars, and wings very delicate blue-grey, paling to white on the upper tail-coverts and tail, and almost into the same on the hind neck; first two primaries black, with the inner margins white, and also the shaft of the 1st quill, that of the 2nd white along the centre; remaining primaries delicate grey, frosted on the outer webs, their shafts whitish; first two primary covert-feathers blackish grey; secondaries with white outer margins near the tips; all beneath white. In some specimens the under tail-coverts next the vent are tinged with grey.

Winter plumage (Hankow, China). Bill brownish yellow; legs and feet dusky yellow; outer tail-feathers not attenuated, 1 inch longer than the adjacent pair.

Forehead and crown white, shading into the black of the nape; sides of the crown behind the eye black, joining with that of the nape; lores just in front of the eye blackish. The black head is assumed about April in Ceylon.

Young, in down (Hambantota, June). Bill fleshy red, with dusky tip; legs and feet fleshy red; ground-colour of the upper surface rufescent whitish, with three dark stripes over the crown; upper surface mottled with black; beneath dusky whitish.

Male, soon after flying. Wing 4·5 inches; bill at front 0·65. Bill, lower mandible and edge of upper fleshy yellow, culmen and tip of lower mandible dusky; legs and feet dingy yellow.

A black spot immediately in front of the eye; lores mouse-grey, tinged with tawny over the crown, which, with the nape and the space behind the eye, is black, edged, except on the latter part, with fulvescent, the black passing into the grey of the forehead; hind neck, back, scapulars, and tertials yellowish tawny, with black oval-shaped markings and dark centres; wing-coverts slate-grey, the median edged with fulvous yellow, with an adjacent

blackish border; quills dark silvery grey, the first two visibly darker than the rest and with whitish shafts; tail pale slate-grey, tipped broadly with tawny yellowish, which is set off by a black border; beneath white. Before the young fly the tawny-yellow coloration is isabelline grey, almost reddish.

About three weeks older than the above. Wing 6·4 inches, reaching 1·0 beyond the tail, which is forked to a depth of 0·75.

Iris brown; bill brownish yellow, gape and base of lower mandible dingy yellow; legs and feet dusky yellow, joints and sides of the webs brownish.

Forehead still mouse-grey, the feathers of the crown margined with fulvous, those of the nape slightly tipped with it; a whitish stripe above the black loreal spot; the marginal coloration of the mantle not so tawny, but greyer; wing-coverts bluish grey; the lesser series dark grey, and the median with the edges fulvous grey; rump and upper tail-coverts pale slaty, the lateral feathers white; tail-feathers whitish, the central pair slaty grey, the lateral pair unmarked, the blackish markings at the tips of the remainder modified into elongated spots.

By degrees the feathers of the occiput and nape become black, and the forehead and margins of the coronal feathers white; the back-feathers are moulted slowly to blue-grey, the colour of the 1st winter, but the tail and wing-feathers are retained, as in other species; and specimens are shot at the end of the year in this mixed plumage. The bill is blackish, tinged with yellow then; the legs and feet dusky yellow.

Obs. The colour of the first two primaries varies a little, owing to exposure, which wears off the bloom of the first, and gives it a darker appearance than the second (see variety *a*, P. Z. S. 1875, p. 377). The bill, though varying somewhat in stoutness, has always a more pronounced gonys than the next species. It does not assume its normal shape and sharp tips until the bird is about five months old. Chinese specimens before me are slightly darker on the back than Ceylonese. A small series varies in measurement as follows:—wing 6·7 to 7·2 inches; bill to gape 1·5 to 1·7; outer tail-feathers in an April specimen, in full breeding-plumage, 2·6 longer than the adjacent pair. An example from Celebes measures—wing 7·5 inches; tail 4·5; bill to gape 1·7.

The Australian Little Tern (*Sterna nereis*, Gould) has the bill very straight and highly compressed and the gonys very long, the tip blackish; legs and feet yellow. The lores are white, with merely a black spot in front of the eye; upper surface exceedingly pale; tail white and deeply forked; and the primaries silvery grey, with the 1st quill dark just adjacent to the shaft, which, with those of the others, is pure white. A specimen before me measures—wing 6·5 inches; tail 3·8; bill to gape 1·7.

As the Black-naped Tern, *St. melanauchen*, is not unlikely to occur in Ceylon, I here subjoin a description from Chinese specimens:—

Adult (China). Wing 8·5 to 9·0 inches; tail 5·5 to 6·0; tarsus 0·7; middle toe 0·6; bill to gape 1·75 to 2·0; outer tail-feathers 3·5 to 3·8 longer than middle pair. Bill very slender. (Mr. Hume gives the length of 24 Andaman specimens as 12·9 to 14·5 inches; weight 2·7 to 3·75 oz.)

Iris brown; bill blackish; legs and feet black.

Head, crown, hind neck, entire under surface with the under wing pure white; a black band passes from the middle of the lores to the eye, widens behind it, and passes in a crescentic shape round the occiput, where it develops into a short crest; back and upper tail-coverts *very delicate* grey; the wing-coverts slightly darker; the quills white, faintly shaded with the palest grey, and with the outer web of the 1st dark grey. In freshly killed individuals the under surface is adorned with a beautiful roseate hue.

Distribution.—The White-shafted Ternlet is a very abundant species on the south-western, eastern, and northern coasts of Ceylon, but is chiefly noticeable during the breeding-season, when large numbers congregate together in certain localities to rear their young. Whether they, to a great extent, leave the island during the cool season, or are so scattered along the whole sea-board that one does not take notice of them, I am not quite prepared to say; but I incline to the former hypothesis, as in some places where they are numerous in the breeding-season, they are rarely seen between the months of November and April. In the nesting-time it is chiefly found about salt lagoons and backwaters and on contiguous portions of the coast; in such localities it is common from Hambantota to Batticaloa, and from Trincomalie to Jaffna. During my residence at Trincomalie I seldom noticed it either on the lagoons about the Fort or in Kottiar Bay until March, after which it steadily increased in numbers till May, when the majority disappeared for their breeding-grounds on the shores of salt lakes. It extends inland at this season, and breeds in considerable numbers at large tanks, such as Kanthelai, Minery, Girentala, and other sheets of water which are deep, well supplied with fish, and

free from reeds or overgrowth, and the shores of which are grassy or gravelly. On the west coast it ranges down to Puttalam, but is rare south of that place. All the specimens procured at Colombo during the cool season belonged to the next species, and at Galle I likewise never procured it. It is often to be seen some distance away from the coast, and frequents the vicinity of the Bass Rocks in great numbers.

In India its range is scarcely satisfactorily worked out, as I find that the Little Terns from most localities are set down by Mr. Hume as belonging to the next species, and to a form which he styles *S. gouldi**, which appears to be a local race of the true *S. minuta* of Europe. The present species no doubt occurs along both coasts to the north of the empire; and Mr. Hume speaks of specimens with two dark, white-shafted primaries being shot while breeding on the Ganges, which appear to me to belong to the same form as our bird, in spite of the rump being grey; for to cast aside such a good distinguishing character as the two dark primaries with white shafts, on account of a difference in the hue of the rump, does not seem to me expedient, inasmuch as it opens the door to the admission of innumerable unsatisfactory races. To the eastward this species extends to China, whence it was first described as the Chinese Tern by Latham; and I have no doubt that it will some day be observed on the coasts of Tenasserim and in the Andaman Islands. Swinhoe records it from China and Formosa, and he found it breeding on the east coast of the latter. It has not been noticed at the Philippines, but it is found in some, and probably will occur in almost all, of the islands of the Malay archipelago. I have seen it from Celebes; and in all probability the Ternlet set down by Salvadori as *S. minuta* (Uccelli di Borneo, p. 378), and recorded from Java, Borneo (Banjermassing, Pontianak), Celebes, Timor, and New Guinea, belongs to this species, some localities perhaps also relating to the next, *S. saundersi*. In Australia it is found down the coast from the Gulf of Carpentaria and Cape York to New South Wales, southward of which it is replaced by the White-lored Ternlet, above noticed. Mr. Ramsay records it from the south coast of New Guinea in his catalogue of the birds of Australia; and Mr. Gould has figured it from this region, where it is doubtless not uncommon.

Habits.—This Ternlet, when not breeding, chiefly frequents the open coast and large bays or inlets of the sea, as well as the mouths of rivers, in which latter it affects the bars where the water is shallow and fish are easy to catch. It is also found on salt lagoons near the sea, but not so plentifully as in the localities just mentioned. In the interior it is partial to the description of tank or lake above mentioned, and is consequently localized to some extent. For instance I saw numbers at the deep open sheet of water, between Minery and Pollanaruwa, which is called Girentala; but at Topare tank, which is choked with vegetation and a favourite haunt of the Marsh-Tern, not a single Little Tern was to be seen. It is a bird of strong and swift flight; but the beat of its wings is somewhat slow, although powerful and productive of considerable speed. Little flocks of half a dozen or more may be seen flying round a particular spot where they have detected an abundance of food, each one now and then hovering over the fish with its bill pointed downwards and suddenly dropping like a stone upon those who are incautious enough to venture too near the surface. It has a parrot-like monosyllabic call, not unlike one of the notes of the Purple-headed Parrakeet, by which peculiar note it may always be distinguished from the next species. This it frequently utters when flying at great speed towards its breeding-place, when it may often be seen carrying fish in its bill. I have never detected any thing else but fish in its stomach; and I think its food principally consists of it, though it may feed to some extent on insects, sand-worms, minute shells, &c. It rests on sand banks or on the open beach, and may sometimes be seen seated on the little dividing ridges which separate the fish-pools constructed by the natives in the various salt lagoons on the east coast.

Nidification.—This species breeds from June until August, the time in the south of the island being from the middle of the former month till the middle of July. At the tanks in the north of Ceylon it lays somewhat later, although I have seen birds carrying fish to their young in June on the salt lakes in the Trincomalie district. The localities chosen are the dry, perfectly level, earthy shores of the leways or salt lagoons of Hambantota, the sandy flats bordering some of the brackish lakes on the north-east coast, and various gravelly or dried-up wastes on the shores of the large tanks in the interior. On the island already alluded to in my

* Preoccupied by Reichenbach in 1856 for *S. fuliginosa*.

article on the Stilt, p. 923, which, in the dry season, is connected with the northern shore of Kanthelai tank, numbers of nests were found in the first week in August, the majority being situated among gravel and shingle, and consisted of a little hollow scooped out and sometimes lined with a few pieces of twig, grass-stalk, or other material collected from the flood-wreck. The perfectly flat and extensive shores of the leways, formed by the drying up of the salt-pans, are, however, better adapted to the habits of this species than gravelly places. There they stamp out a tiny very shallow hollow and lay their eggs, without any lining at all. In some cases these hollows are almost imperceptible, and the eggs repose on the flat, powdery, half sandy, half carthy ground. No two nests are nearer than 10 feet to one another, and the usual number of eggs is two. In some nests three were found, and in one six; but the latter were the product of two birds, as some of the number had been rolled out to the side of the nest, showing that the nest had been taken possession of by another bird after the rightful owner had laid her eggs. The birds were seated or standing by their eggs, and always rose when I was at some distance from them, but afterwards displayed considerable courage, flying round and round close to me, and screaming and swooping down as their eggs were approached. These were divisible into several types, some being long ovals, nearly equal in size at both ends, some pointed ovals, others oval, stumpy at the small end and rounded at the opposite, and not a few were short, broad, very rounded eggs. The first mentioned are dealt with in the succeeding article, as they are presumed to belong to another species, many of which were at this breeding-ground. The eggs of the other types were stone-grey, yellowish buff, slightly brownish buff, and olivaceous grey in ground-colour, and were, for the most part, marked with small and rounded blots and blotches of dark sepia and rich brown of several shades, mixed with underlying blots of bluish inky and purplish grey, which are pretty evenly scattered over the whole egg; others are entirely marked with reddish-brown specks and short dashes mixed with small specks of underlying pale colour; and some are streaked and pencilled with straggling lines of olive-brown over blots of pale bluish grey. Various specimens measure—1.26 by 0.96, 1.3 by 0.95, 1.2 by 0.93, 1.21 by 0.92, 1.23 by 0.96, 1.34 by 0.91, 1.2 by 1.0, and 1.13 by 0.96 inch, the two latter being remarkably rounded eggs.

When getting fledged, the young run fast and hide themselves among stones, to which their colour assimilates so nearly that it is difficult to see them.

STERNA SAUNDERSI.
(THE GREY-RUMPED TERNLET.)

Sterna sumatrana, Raffles, *apud* Saunders, P. Z. S. 1876, p. 663; Hume, Str. Feath. 1878 (B. of Tenass.), p. 493.

Sternula minuta, Linn., Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271 (in part); Hume, Str. Feath. 1876, p. 469.

Sterna saundersi, Hume, Str. Feath. 1877, pp. 224, 225 (note); id. Str. Feath. 1879, p. 116 (List B. of Ind.).

Characteristics. *Slender dark bill; short tail; grey rump, upper tail-coverts, and tail; first three quills blackish grey, with blackish shafts.*

Adult male (Hambantota, June). Length 6·8 inches; wing (imperfect) 6·3; tail 2·7, fork 0·6 deep; tarsus 0·65; middle toe 0·49; bill at front 1·05, gonys 0·75.

Iris brown; bill yellowish brown at base, then dusky yellow, and black at the tip for 0·5 inch; legs and feet yellowish brown, claws black. The bill in this specimen has the appearance of changing to a yellowish hue.

Crown, occiput, and nape black, as also a broad band from eye to nostril, the boundary of the black behind the eye on a level with the lower edge of the eyelid; forehead white, extending in a band as far back as the middle of the eye; back, wings, *rump*, and *upper tail-coverts* blue-grey; tail somewhat paler, the inner webs of all but the central feathers white; first *three* primaries greyish black, the inner half of the inner webs white, the shafts *jet-black*; remaining primaries and secondaries blue-grey; *all* the primary-covert feathers blackish grey; cheeks, ear-coverts, entire under surface, and under wing pure white.

Winter plumage (Jaffna, March). Length 8·1 inches; wing 6·9; tail 2·5; tarsus 0·65; middle toe and claw 0·75; bill at front 1·2, gonys 0·75.

Bill, if any thing, blacker than in the above, there being less of the yellow tint; legs and feet the same as in summer. The bills in some examples at this season are yellower than in others, and all have the appearance of being in a state of change to yellow in the basal part.

Forehead and front of lores white, passing into greyish on the crown, and thence into blackish on the occiput, nape, and the space between the latter part and the eye; a black spot in front of the eye; upper surface as in summer; outer tail-feathers white, slightly sullied with grey; primaries and their coverts as in summer. In old feather the 1st primary-shaft is often so bleached by the sun that it is almost pure white; the 2nd, however, remains blackish; and birds may be procured in the spring while moulting with the 2nd primary new and black-shafted and the 1st old and white-shafted.

Young. The nestling is in all probability indistinguishable from that of the last species.

Immature, in first plumage (October). *Male and female.* Length 7·9 to 8·0 inches; wing 6·6 to 6·7; tail 2·2 to 2·5, depth of fork 0·5; bill at front 1·05 to 1·1.

Bill black, yellowish at gape and along the edge of the lower mandible; legs and feet yellow-brown, toes darker than web.

Forehead grey, passing into brownish on the crown and blackish brown on the occiput, nape, and behind the eye, the feathers of these parts tipped with greyish; hind neck bluish grey; back and scapulars grey, with white centres and edges, separated by broad brownish pencillings; rump and tail blue-grey, tinged with brownish; the outer tail-feather whitish, remainder marked with brownish near the tips; tertials with pale margins and inner brown borders, breaking into bars on the inner webs; lesser wing-coverts brown; median slate-grey, edged with brown; first *six* primaries greyish black, the first *four* with jet-black shafts; beneath as in the adult. An older specimen has the back mostly blue-grey, with a few blackish-marked feathers, and the dark edgings of the median wing-coverts nearly vanished from abrasion.

After the acquisition of the grey plumage in the first winter, the dark band along the ulna is the only sign of immaturity remaining; the bloom is then worn off the primaries, which are not changed with the clothing-feathers in autumn, and they are very dark, as also their coverts.

Obs. I have followed Mr. Hume in applying the title *saundersi* to this species instead of *sumatrana*, which has been adopted by Mr. Saunders, because I think Raffles's description of his small species from Sumatra does not satisfactorily apply to our bird. It is that of a young bird, and is as follows:—"A small species, with a short tail and wings about the same length with it. The prevailing colour is white, tinged on the back, head, and wing-coverts with light reddish brown, and mixed with a few dark spots; a blackish crescent extends from eye to eye, round the back of the head; wing-feathers lead-grey, the first one nearly black; lower parts more white; tail of the same colour as the back" (Trans. Linn. Soc. xiii. p. 329, 1822). Now in our bird, when immature, nearly all the primaries are black, and, further, there is no such crescent from eye to eye. It is probable, as Mr. Hume suggests, when he proposed his title in honour of Mr. Saunders, that Raffles was dealing with the Black-naped Tern, *S. melanauchen*. I would add that Indian specimens of *S. saundersi* are clearly the same as Ceylonese, as there could not well be two species of dark-rumped Little Terns in these regions.

The specimen above described is not perhaps in perfect breeding-plumage, and the organs were but little developed. It appears, from data given by Mr. Hume concerning a specimen taken at Kurrachee off the eggs, that the bill is yellow, broadly tipped with dusky; and this was what my specimen was turning to. The dimensions of this Kurrachee bird are:—length 9.12 inches; wing 6.43; tail 3.0; tarsus 0.6; bill at front 1.12, from gape 1.5.

S. minuta, Linn., the European representative of this species, is found in India, as I have seen specimens collected at Futtehghur not to be separated from Spanish birds, though the upper tail-coverts were scarcely so white. It differs from the present species in having a stouter bill, the black of the crown not generally coming so far forward in a point upon the forehead, in the first two quills and the first two primary-covert feathers being black, with black shafts, the remaining feathers being grey; and finally in the upper tail-coverts and tail being white: wing 6.5 to 7.0 inches, bill at front 1.1 to 1.2. Indian specimens incline towards a greyer rump than European; but the quills are coloured in the same manner, and the character in question is a slight local variation only.

In specimens from hot climates (one from Tonghoo and another from Abyssinia are before me) the centre of the shaft of the first quill becomes bleached from the effect of sun and salt-water, and the bird looks at first like the last species; but the second quill-shaft is always jet-black, which is a characteristic of true *minuta*. This peculiar feature seems to me to have caused erroneous theories as to this latter bird not being found in India, and I imagine is one of the characteristics of Mr. Hume's *S. gouldi*, combined with the trifling greyish tint of the upper tail-coverts before mentioned. I have, however, never found an example in Ceylon with two black-shafted black-webbed quills and pale rump; and I therefore do not admit the species into our lists. Mr. Saunders recognizes a form intermediate between the Grey-rumped and the White-rumped Ternlets (*S. minuta*), which is found on the coasts of America, and to which he applies Lesson's title, *S. antillarum*. It has the bill more slender than the White-rumped, but not so attenuated as the Grey-rumped Ternlet, and the rump and upper tail-coverts are pearl-grey, like the mantlet. It appears to me, after examining his specimens, to be scarcely separable from the former species.

Distribution.—This Ternlet is not so abundant in Ceylon as the last species; but it is widely distributed, being found even on the west coast in the north-east monsoon. It may often be seen on the Colombo Lake from November till March; and it is likewise met with on the Negombo, Bolgodde, and Amblangoda lakes. On the south-east coast it occurs in tolerable numbers, but not so plentifully as the White-shafted Ternlet, although in the breeding-season apparently a fair percentage of all the Ternlets I saw there belonged to it. I have met with it at Batticaloa, and further north, in the Trincomalee district, it is as common as it is at Hambantota. In the Jaffna peninsula it seems to be almost as numerous as the white-shafted species, as most examples I shot on the Jaffna Lake in March belonged to it; they were beginning then, in some instances, to acquire the black summer cap. It is found on the coasts of India and Tenasserim, and is common in the Laccadives; but I see no record of its occurrence at the Andamans. It has been obtained at the mouth of the Laynah creek, south of Mergui, and is believed by Mr. Davison to inhabit the Mergui archipelago. Mr. Hume has recorded it from Madras, and also from the Sutej river, where it apparently breeds, as the specimen in question is said to be a nestling. It is common at Kurrachee and breeds there. Beyond the confines of India to the westward its distribution is but little known. Mr. Saunders has seen a specimen from Zoulla (Red Sea) which he identifies with this species; and likewise has an example in his own collection from Fantee, west coast of Africa.

Habits.—This Ternlet much resembles the last species in its habits. Its flight is quite as swift, and it has the same fashion of hovering over the water with bill pointed downwards, and then plunging perpendi-

cularly on its prey. It is fond of resting on sand banks at the base of creeks and lagoons in little troops of a dozen or so; and it may generally be seen thus assembled about 10 or 11 in the forenoon, reposing after its morning's hunting. Its note is quite different from the Parrot-like pipe of the white-shafted bird, and it is not so noisy. I have noticed it more about fresh water in the cool season than this latter; it is the common Ternlet on the Pootoor lagoon and also on the Colombo Lake.

Nidification.—As there were many examples of this species at the breeding-station of the Ternlets near Hambantota, and as I shot them while flying in from the sea with food in their bills, there is every reason to infer that some of the nests I found belonged to it. In a few there were eggs of a different type to that of the majority of specimens I took; they were rather larger, and marked with large blots or clouds of rich sepia of several shades over lighter clouds of bluish grey, brownish grey, and purple-grey, the smaller end of the shell having a few more reduced spots. In some the markings were slightly straggly, in others they were rather regular. The ground-colour varied from pale greenish stone to brownish buff. They vary from 1.25 by 0.91 to 1.35 by 0.93 inch.

Captain Butler describes the eggs he took at Kurrahee belonging to this species as pale drab with a faint greenish tinge, or greyish stone-colour with primary streaks, blotches, and spots of deep brown, and secondary (that is, the underlying) clouds of pale inky blue. The nests were, as in Ceylon, slight depressions in the ground, the eggs in some cases being deposited in wheel-ruts and horse-footprints.

STERNA BERGII.

(THE LARGE CRESTED TERN.)

Sterna bergii, Licht. Verzeich. p. 80 (1823), *ex* South Africa; Von Heuglin, Orn. N. Ost-Afr. ii. p. 1436 (1873); Legge, Ibis, 1874, p. 33; Saunders, P. Z. S. 1876, p. 657; Hume, Str. Feath. 1876, p. 470, et 1878, p. 493 (B. of Tenass.), et 1879, p. 116 (List B. of Ind.); Butler, *ibid.* 1877, p. 298.

Sterna cristata, Steph. in Shaw's Gen. Zool. xiii. pt. 1, p. 146 (1825); Salvadori, Uccelli di Born. p. 376 (1874).

Sterna velox, Rüpp. Atlas, p. 21, pl. 13 (1826).

Sterna pelecانoides, King, Surv. Int. Austr. ii. App. *Aves*, p. 422 (1826); Legge, Ibis, 1875, p. 407.

Thalasseus pelecانoides (King), Gould, B. of Austr. vii. pl. 23 (1848).

Thalasseus poliocercus, Gould, B. of Austr. vii. pl. 24 (1848).

Thalasseus cristatus (Steph.), Blyth, Cat. B. Mus. A. S. B. p. 291 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Holdsw. P. Z. S. 1872, p. 481; Jerdon, B. of Ind. iii. p. 842.

Thalasseus bergii (Licht.), David & Oust. Ois. de la Chine, p. 523 (1877).

The Crested Tern, *The Larger Sea-Tern*, *The Swift Tern* of some. *Kādal Kuruvi*, Ceylonese Tamils; *El Hekt*, Arabic (Heuglin); *Tola* in the Friendly Islands.

Liniya, Sinhalese.

Note. The present species, the next in order, and one or two allied Terns form a small well-marked group, with stout rather curved bill, strongly pronounced gonys, elongated nuchal feathers, and completely webbed feet, which are classed by Boie as Sea-Terns (*Thalasseus*).

Adult male and female (Ceylon). Length 20.0 to 21.5 inches; wing 13.9 to 14.75 (average about 14.4); tail 7.0 to 8.6, fork of the tail about 4.0 deep; tarsus 1.25 to 1.35; middle toe and nail 1.3 to 1.45; bill to gape 3.4 to 3.6, at front 2.5 to 2.7. Expanse 42 to 46 inches. Females in this species are, as a whole, no smaller than males.

Breeding-plumage. Iris dark brown; bill murky yellow, tinged with green in parts; roof of mouth and tongue bluish; legs and feet black, with a reddish tinge, soles yellowish.

Forehead to within $\frac{1}{4}$ inch of the bill, top of the head down to a line with the lower eyelid, occiput, and a pointed crest of about $1\frac{3}{4}$ inch in length glossy black; point of the forehead, lores, face, entire neck, and under surface, with the under tail-coverts, under wing and its edge pure white; back and wing-coverts dark slate-grey, paling on the upper tail-coverts and tail, and blending into the white of the hind neck; lateral tail-feathers, which are very much attenuated, with most of the outer web white; quill-shafts white; primaries dark iron-grey, "frosted" with silvery grey when first moulted, but in old feather turning to blackish brown, the inner portions white, extending on the 1st along the edge to the tip, but running in a point into the black extremities of the rest; secondaries dark grey, with their terminal margins and inner portions white. In some examples the black forehead approaches to within 0.1 of the bill, but never touches it as in the next species.

Winter plumage. Bill greener than in summer; legs and feet pure black.

Forehead and lores white, as also the coronal feathers, the central portions of the latter being black, which gradually increases, leaving the edges and tips only of the nuchal feathers white; a black border in front of the eye, and the upper check and ear-covert feathers striped with the same, varying according to the individual; back and wings not so dark as in summer.

Examples shot in January in Ceylon show signs of moult in the wings and tail, so that the winter plumage is not complete until very late. The outer tail-feathers are not so pointed as in summer, when, however, they speedily become abraded after being acquired in April.

Young. I have not had an opportunity of examining a nestling of this species.

Immature, 1st plumage. Wing 12·8 inches; tail 5·5; tarsus 1·12; middle toe 1·05; bill to gape 3·0, at front 2·2. Feathers of the back and scapulars with large terminal brown spots; longer scapulars, tertials, and greater coverts brown at the tips, with a whitish margin; median wing-coverts marked with paler brown than the back; the lesser series blackish brown, edged with white; secondaries blackish terminally, the inner webs white; primaries black, tinged with grey; tail slightly paler, tipped with white; head and nape blackish brown; the forehead and front of crown whitish, spotted with brown; beneath white, striped with brown on the sides of the neck, face, and across the fore neck; the upper throat and breast unmarked. The tongue is bluish in the immature bird. An example from Bass's Straits, Australia, younger than the above, has the same general character of plumage, the forehead being of course darker, as this becomes pale with age. Birds in the second year show their immaturity in the dark band on the ulna adjacent to the edge of the wing. An October example in the 2nd year (female) measures—wing 14·7, bill at front 2·65.

Obs. This species has been greatly subdivided, owing to local variation in the colour of its plumage and its dimensions, a parallel to which we have in many other widely-distributed forms. Hence we have it described from the Cape as *S. bergii* by Lichtenstein, as *S. velox* from the Red Sea by Rüppell, *S. pelecanoides* from North Australia by King, and, finally, as *S. poliocercus* (its smallest form) from the south of Australia by Gould. Mr. Saunders has rendered good service in examining either the types of these and other races into which the species has been subdivided, or carefully comparing a large series of specimens, including all the representatives of the races in question, and finally coming to the conclusion that there is but one good species to be made out of them all. I have myself looked over a considerable series from various parts of the world, and I can wholly indorse his verdict. The main character of the species is the black cap, of similar boundary in all, and the white forehead formed by the termination of that cap at a certain distance from the bill. Even in Ceylon there is a considerable variation in size and colour; but fine specimens in good plumage are quite equal in size to those from Africa. Towards China the species begins to decrease in size, and in the south of Australia reaches its minor limit. Examples in summer plumage, in the Swinhoe collection from Amoy, measure as follows:—wing 13·1 to 13·4 inches, tail 6·9, tarsus 1·1, bill at front 2·2 to 2·4. A female from the island of Morotai, collected by Bernstein, measures—wing 13·0, bill at front 2·3, showing a decrease in the wing, but an increase (individual) in the length of the bill. Specimens of *S. poliocercus* in Mr. Saunders's collection range as low as 12·75 in the wing. Mr. Hume furnishes some very valuable data concerning the size of Indian examples; he found those he procured at the Laccadives rather smaller than those from the mainland, the wing-measurement varying from 13·5 to 13·8; that of specimens from various parts of the coast from the Persian Gulf to Tenasserim is 13·2 to 15·12, three fine examples from Astolah measuring 14·75, 14·87, 15·12 inches.

Distribution.—This fine Tern is found all round the coasts of Ceylon more or less throughout the year, being, however, most numerous on both sides of the island during the breeding-season, at which time it frequents the stretches of coast adjacent to its "colonies." They are mostly seen about the coast during stormy weather, except in the latter part of the year, when they are very abundant on the rocks near Colombo, a large proportion of the flocks seen there being composed of young birds. They appear in considerable numbers near Galle in the "Little Monsoon," or first break-up of the fine weather in April, being then driven from the sea towards the shore. During the lull that follows they again go out to sea, and do not frequent the shore in numbers until the end of May, at which time they are collecting at the breeding-"colony" on the rock near Balapitiya. In July I have seen it in the Hambantota district; and in August great numbers frequent the vicinity of the "Basses," and doubtless are the progeny of some "colony" in the vicinity. At Trincomalee they are common from September until April, but not so abundant as the next species. About the shallow waters surrounding the Jaffna islands and on the "Lake" I do not think they are, as a rule, so plentiful as on the exposed and rocky coasts of the island.

It is found on all the coast of India, but apparently is more abundant on the western side, being a common bird on the Malabar coast and near Bombay, and very abundant in the Laccadives, where Mr. Hume considers there must be a breeding-colony at Perc-Mull-Par. On the west coast it is found at Madras pretty commonly, but is met with rarely round the head of the Bay and along the coast of Tenasserim, as Mr. Hume records it only from the south of Mergui. It frequents the coast of Sindh, Kurrachee harbour, and the Gulf of Oman, breeding in immense numbers on the island of Astolah. It inhabits presumably the

Persian Gulf, and is found round the coasts of Arabia to the Red Sea, where, writes Von Heuglin, it is common, except in the northern half. It is, however, resident, says Captain Shelley, in Lower Egypt, and various naturalists have noticed it in Port Said. On the Somanli coast Mr. Heuglin found it common, and discovered it breeding not far from the shore further north, between Suakin and Massowa. Southwards it extends down the eastern side of the continent to the Cape, where it is, according to Layard, one of the commonest of Terns, breeding to the north-west of Cape Town. It is recorded from Algoa Bay and Natal, and also from Mozambique and Zambesi. Newton found it in Madagascar, Rodriguez, and also at the Seychelles. It is found in Damara Land in Walwich Bay, but does not extend further north than that latitude, being replaced on the west coast by *S. maxima*, which Captain Shelley records, in the 'Ibis,' 1872, under the name of *S. bergii*, as "being the commonest Tern at Accra and Cape-Coast Castle."

Returning to the Asiatic region, we find it common on the China coasts, breeding on Kelung Island, N. Formosa. It was obtained in the Philippines at Zamboanga by the 'Challenger' naturalists, and also in the Admiralty Islands. In the Malayan archipelago it is almost universally distributed, having been obtained in Sumatra (Lampung), Java, Borneo (Labuan), Celebes, Batchian, Gilolo, Morotai, Amboyna, Ceram, Mysol, Aru Islands, Obi, Timor, Flores, and New Guinea. In Australia it is found round the entire coast. In Torres Straits Macgillivray found it breeding in May and June; whilst on the west coast Gilbert took its eggs on Bathurst Island, where it resorts in great numbers in December. It is very abundant in Bass's Straits and off the coast of New South Wales, being found in flocks of from ten to fifty in winter, according to Gould, and breeding there in summer. It is found at Norfolk Island; and, according to Layard, it is common in New Caledonia, and distributed throughout the New Hebrides and the Fiji Islands. It is recorded by Finsch from the Friendly group and from the island of Pouapé. It has likewise been found in the Society and the Sandwich Islands, and is doubtless universally distributed throughout Polynesia.

Habits.—The Swift Tern, as it is sometimes called, is entirely a maritime species, frequenting open coasts, deep harbours and bays, and often straying many miles away from land. It confines itself, as much as possible, to rocky places, and particularly to parts of the coast where there are isolated rocks standing out a little distance from the land, on which it delights to rest when not fishing, huddling together, so that the surfaces of small rocks are completely covered by them sometimes. From these trysting-places they sally out in small parties of half a dozen to fish, and do not congregate on the wing in such numbers as the next species. They scarcely ever alight on sand, being the most rock-frequenting species we have in Ceylon. It is a powerful bird on the wing, but not any swifter than the next, and is not such a skilful "plunger," displaying less agility than its smaller ally. It appears to rest during a great portion of the day; and I am inclined to think, from the noise I used to hear at nights on the rocks opposite my quarters at Colombo, that they are about a good deal at that time, perhaps fishing when the moon is sufficiently bright to enable them to see their prey. Their note is a harsher and louder croak than that of the next species, and it is not so frequently repeated on the wing; but when there is not enough room to accommodate their numbers on a small rock there is generally a good deal of clamour going on, the latest comers, and, as usual, the worst served, attempting to settle down where it is not possible for them to do so, and flying up and circling round their more fortunate companions with loud cries. They course backwards and forwards over the same spot in search of their food, which consists entirely of fish, upon which they pounce heavily, often nearly immersing themselves in the water. Layard speaks of them at the Cape of Good Hope resorting to the craft in the harbour, and sitting on the mast-heads, along the bowsprit and taffrail as close as they can find room, knowing well that the police regulations prohibit their being shot at among the shipping.

Nidification.—Mr. Nevill, C.C.S., has taken the eggs of this Tern in June from a rocky islet, some little distance from the shore, at Balapitiya, about 20 miles north of Galle. I am not sure that this is a regular breeding-place; for in 1871, when I was at Galle, they did not appear to be breeding there, at least so far as I could judge from inquiries made. They doubtless nest annually at some spot on the south coast; and those who are interested in oology ought to make a point of discovering their colonies, one of which may be on some rocks near Hatagalla. In my notice of its distribution I have referred to several breeding-places of this species, and one of the largest of these is that on the island of Astolah, in the Gulf of Oman. Captain E. A.

Butler, 83rd Regt., visited this place in May 1877, and found the Terns breeding in groups, making no nest, not even scratching a nest-hole. "The eggs," he writes, "are laid on the bare ground, in the most open and exposed parts of the island, about 1 foot apart; and when sitting the birds seem packed together as close as possible without perhaps actually touching each other." So close are the eggs laid to one another that a lot of 47, belonging to a large group of birds, did not occupy more than 6 or 8 square feet. On retiring a little distance, after frightening the Terns from the nests, hundreds of Sooty Gulls mixed with them, and descending with the owners of the eggs, fought with them, carrying off the eggs as fast as possible and devouring them.

I have been favoured by my friend Mr. Howard Saunders with a view of a large series of the eggs taken by Captain Butler on this occasion. They are exceedingly variable, the ground-colour being pale reddish grey, dark salmon-colour, pale stone-grey, pale reddish white, and light greyish. They are of the usual shape, rather more pointed than those of many other species. Some are marked with bold hieroglyphic streaks, and others with rounded blotches of deep red-brown; others with huge blots or clouds of blackish sepia, some, again, with long bold straggly lines of the same, mixed with rather fine irregular streaks of olive-brown. The bold markings are, for the most part, at the large end, with a few scattered over the surface at the small end; the underlying coloration consists of clouds and spots of pale reddish or bluish grey; but some eggs are almost devoid of the latter. The dimensions of several are 2.37 by 1.72, 2.3 by 1.73, 2.45 by 1.67 inches. They are rather rough in texture. Eggs from the Red Sea do not differ from the above: two specimens in Mr. Dresser's collection are pointed ovals, of a rather chalky texture and stone-white ground-colour, marked throughout with blots of rich dark brown over large blotches and clouds of dark inky grey; they measure 2.17 by 1.52 and 2.21 by 1.53 inches. Another is of a buff-grey ground-colour, closely marked with large clouds of umber and olive-brown, taking a longitudinal direction, and under which there are smaller markings of dusky bluish grey; it measures 2.23 by 1.5 inches.

STERNA MEDIA.

(THE LESSER CRESTED TERN.)

Sterna media, Horsf. Trans. Linn. Soc. 1820, xiii. p. 198; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1430 (1873); Legge, Ibis, 1875, p. 408; Saunders, P. Z. S. 1876, p. 655; Dresser, B. of Eur. pts. 71, 72 (1878); Hume, Str. Feath. 1878, p. 493 (B. of Tenass.), et 1879, p. 116 (List B. of Ind.).

Sterna affinis, Rüpp. Atlas, p. 23, pl. 14 (1826).

Sterna bengalensis, Lesson, Traité d'Orn. p. 621 (1831); Hume, Str. Feath. 1873, p. 284; Legge, Ibis, 1874, p. 33.

Thalasseus torresii, Gould, P. Z. S. 1842, p. 140; id. B. of Austr. vii. pl. 25 (1848).

Thalasseus bengalensis (Lesson), Blyth, Cat. B. Mus. A. S. B. p. 291 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 843 (1864).

Thalasseus medius (Horsf.), Holdsw. P. Z. S. 1872, p. 482.

The Allied Tern, The Lesser Sea-Tern, of authors. *Toyang Kacher*, Java (Horsf.); *Abu queschesch*, Arabic (Heuglin).

Adult male and female (Ceylon). Length 14.5 to 16.75 inches (dependent on the length of the tail in the breeding-season); wing 11.3 to 12.4; tail 4.8 to 6.25 (fork 2.4 deep in longest); tarsus 1.0 to 1.1; middle toe and nail 1.1 to 1.2; bill to gape 2.6 to 3.0, at front 1.9 to 2.2.

Females average smaller than males; the size of the bill varies much in both sexes.

Iris brown; bill orange-yellow; legs and feet black, soles of toes yellowish.

Breeding-plumage (Ceylon). Entire forehead, lores, and head (to a line with the lower eyelid), occiput, and crest of 1½ inch in length, glossy black; lower half of lores, face up to the eye, hind neck, and whole lower surface, including the under tail-coverts, edge of and under wing pure white, the breast in some suffused with a very slight rosy hue; interscapular region, back, tertials, wing-coverts, and tail above very pale blue-grey, blending into the white of the hind neck, the pointed lateral tail-feathers paling almost into white; primaries, when freshly moulted, with their outer webs and terminal portion "frosted" silvery grey, changing into iron-grey on the inner web next the shaft, the rest being white; secondaries a slightly deeper grey, with their inner portions and a terminal defined edging white, as in other species. Some time after moult the bloom or frosting fades entirely from the quills, and the grey portion becomes blackish.

Winter plumage. Bill in some as in summer, in others chrome-yellow, sometimes slightly tinged with green.

Forehead and lores unspotted satiny white; crown white, the feathers blackish grey in the centre; on the occiput the white decreases, and the feathers are almost entirely black, as are also the crest and a band running forward to the eye; a black border in front of the eye, and in some a few black streaks beneath it; remainder of the plumage as in the summer, but the tail and its coverts darker grey; the lateral tail-feathers not quite so long as in summer. Specimens shot in December have not quite completed their winter livery as regards tail and wings; and by the end of March many examples are to be found with black heads. The amount of black on the crown varies considerably, some examples having only the edges of the feathers white in that part. This Tern differs materially from the last in winter plumage in wanting the white edgings to the nape-feathers.

Young. The immature bird in first winter has the bill paler yellow than in the adult; the feet and legs sometimes spotted with yellow.—*Male* (December). Wing 11.0 inches; tarsus 1.0; tail 4.2; bill at front 1.85.

Head as in the adult in winter, but the occipital feathers not so elongated and of a brownish-black hue; scapulars, tertials, and wing-coverts brownish towards the tips, with the edges buff-grey; the feathers of the back are blue-grey, and have replaced those of the nestling-plumage; quills blackish grey, "frosted" on the outer webs, and

with the inner webs of the two first quills marked with white, as in the adult; terminal portions of the tail-feathers brown, with the extremities whitish; the least wing-coverts brown, forming a conspicuous band along the ulna.

Obs. Examples of *S. affinis* from the Red Sea are identical with Indian birds. A specimen before me measures as follows:—wing 11.4 inches; tail 4.6; tarsus 1.0; middle toe 0.8, its claw 0.3; bill to gape 2.9, at front 2.1. The tints of the upper surface are the same as in Ceylonese birds. Mr. Hume gives the dimensions of a Laccadive *female* as—length 15.0 inches; expanse 35.25; wing 11.3; tarsus 1.0; bill from gape 2.6; weight 8 oz. A *male* from the Gulf of Oman—length 16.5 inches; wing 12.25; tail 6.0; tarsus 1.1; bill to gape 2.93. The North-Australian bird, *S. torresii*, is identical with ours; but on the coasts of New Zealand and Tasmania it is replaced by another species, *S. frontalis*, Gray, which differs in having a black bill, like that of the Sandwich Tern, and the forehead, in summer plumage, is white, as in the species last noticed: a specimen before me measures—wing 10.5 inches, bill to gape 2.2. The present species is allied to the American Crested Tern, *S. elegans*, Gambel, and *S. eurynatha*, Saunders, but is, according to Mr. Saunders, smaller, and has the gonys not so long, and the rump and tail much darker.

As the Sandwich Tern, *S. cantiaea*, Gm., has been referred to above, it may be well for me to notice it here, as it may some day occur in Ceylon, being very abundant off the coast of Sindh. It may be distinguished from all other Terns inhabiting this region by its long, slender, black, yellow-tipped bill. In winter the forehead and front of crown are satiny white, and the occiput and nape marked as in the Large Crested Tern; the upper surface is very pale blue-grey, the primaries light silver-grey, the tail and its coverts almost white. A specimen in my collection measures:—wing 11.4 inches; tail 5.0; tarsus 1.1; bill to gape 2.95. The outer web is considerably excised. Bill black to within 0.4 inch of the tip, which is yellow; legs and feet black. In summer the head and forehead are black down to the bill.

Distribution.—This Tern is the most numerous species on our coasts, and is perhaps equal in point of numbers with the Marsh-Tern. In the north of the island it is, together with the Gull-billed Tern, the most abundant of its family. It is common on the west coast from September until May, frequenting the rocks at Colombo, and fishing much in the freshwater lakes round Slave Island. It is also numerous on the brackish lake at Negombo. By the middle of May it disappears from this part of the island, many birds being in summer plumage and many in winter at that time. In the north-east it appears in August, and by the end of October great numbers are about the coasts, more being seen in windy rainy weather near the shore than when it is fine. It leaves this part also in May. During the month of March I found it very numerous on the Jaffna Lake and at Manaar, as also about Karativoe and the adjoining islets. As regards the south-eastern region, the locality where Terns are most abundant, its distribution is singular, for, like the Gull-billed Tern, numbers are to be seen there in non-breeding plumage throughout the summer. Examples shot then, as a matter of course, showed no signs of fecundity. There appears to be no other solution of the abundance of non-breeding Terns in this portion of Ceylon than in the hypothesis that they are birds bred south of the Line in the opposite season to the breeding-time in India, and which come to Ceylon when the cool-season birds leave to rear their young in localities north of the island. In August great numbers of this species are to be seen out at the Basses, which is the great fishing-ground of the Terns on the south-east coast.

At the Andamans it has not been observed, and it is only recorded by Mr. Davison from one locality (Camorta) in the Nicobars. In Sumatra it has been procured at the south-east corner (Lampong) and also in other districts by Müller; whilst in Java it was obtained by Horsfield, and first described by him from that island. On the west side of India Mr. Hume met with it in the Laccadives, at Pere-Mull-Par and Cherbaniani. On the coasts of the mainland Jerdon says it is perhaps more abundant than the last species, “especially about the backwaters of Madras and the Malabar coast.” Higher up the Bay on the east coast it is rarer; and on the other side Blyth is the only naturalist who has recorded it from the shores of Tenasserim. It is common about Bombay and on the coast of Sindh in harbours and backwaters; from the Indus to Gwader it is very abundant, says Mr. Hume, being found there in vast flocks with the Sandwich Tern. Thence westwards it will in all probability occur in tolerable numbers in the Persian Gulf and round the coast of Arabia, where Von Heuglin says it can scarcely be called a resident, though it is common in the Gulf of Aden. In the Red Sea it is resident, but confined chiefly to the southern portion, being only found occasionally on the Egyptian part of the coast and on the lagoons of the delta. Captain Shelley, however, remarks that it is

resident in Lower Egypt; Mr. Stafford Allen has found it at Alexandria in June; and Mr. Dresser has eggs taken by this gentleman on the coasts of the Red Sea. It extends southwards to Zanzibar, and has also been procured in the Comoro Islands, at Mayotte, and in Madagascar.

Returning now to the Mediterranean, we find it occurring along the south coast, breeding near Tunis, and straggling as far west as Gibraltar, where Col. Irby says it occurs in spring. Near Tangier, Favier states that it is occasionally met with; but further south, near Larache, it is more common during the months of September, October, and November. At the eastern end of the Mediterranean it occurs in the Greek archipelago; and Canon Tristram records it from Caiffa Bay, on the shores of Palestine.

In conclusion, to trace out its distribution beyond Java, I find that it has been procured in Celebes, but is doubtfully assigned to Java by Salvadori. Still further to the south, it is found on the north coast of Australia, where Gould records it as abundant in the harbour of Port Essington and on the adjacent islands. Mr. Ramsay further records it from Port Darwin, Cape York, and the Gulf of Carpentaria. It is noteworthy that it is not found on the China coasts.

Habits.—This elegant Tern, like the last species, frequents bays, harbours, and the open coast, wandering in fine weather far out to sea; it is also found on salt lagoons, estuaries, and freshwater lakes in the vicinity of the sea, in which latter it feeds abundantly on small fish, pouncing on them with unerring aim, and very rarely rising from the water without a fish in its bill. Its prey is always seized across the body, and then tossed head foremost into the mouth as it rises again; and so active is it on the wing, that I have frequently seen it drop a fish while adjusting it in its bill and easily catch it again before it reached the water. It will often descend like an arrow, and then, suddenly checking its progress just above the water, it will spread out its wings and “delve up” the fish which has happened to be close to the surface. It is a pretty sight to see several hundred of these Terns hovering over a crowd of fish, hemmed in in a large sein-net, plunging rapidly on their imprisoned prey, and rising each time with a fish in their bills. Their favourite food on the east coast is the sardine (*Sardinella neohowii*), on which it will feed till its entire stomach and throat are crammed. When pouncing on a shoal of these fish it entirely immerses itself in the water, shaking the wet from its plumage with a flutter of its wings as it rises again, immediately plunging anew. Von Heuglin states that it dives from the surface of the water; but during my eight years’ acquaintance with it I never saw it once alight on the surface of the water; and the same has been my experience of the last species. It rests for the most part while digesting its food upon rocks, and very seldom is seen upon sand; but I have occasionally seen one perched on the telegraph-wire crossing the Colombo Lake. It is one of the noisiest of Terns, perpetually giving out its harsh note while fishing; and when a large flock are heard in the distance the sound produced is something like the creaking of a gate. Their ordinary progress on the wing is very rapid, and they make good headway against a storm of wind and rain, frequently shaking off the wet from their backs by a tremulous motion of the body.

Nidification.—As yet this species has not been found nesting in Ceylon or in India; and the nearest breeding-place I am acquainted with is that on the island of Arabi, in the Persian Gulf, where Captain E. A. Butler found it nesting in July 1878. In the Dahlak archipelago, in the Red Sea, Von Heuglin found them nidificating from June until August. There they prefer, he says, low sandy places, where a scanty vegetation, consisting of soda-plants, is growing; and there numerous nests are placed close together, consisting merely of a depression in the sand. The eggs are usually two in number, and the birds incubate chiefly in the cool of the evening and during the night. The birds defend their nests with great courage, confronting any intruder with loud cries and blows of their pinions.

Eggs of this species from the Persian Gulf vary in ground-colour from warm reddish or pale salmon-red to stone-white, between which extremes there are many tints of buff. They vary much in the character of their markings, but not in the tints of the same. Some have huge clouds of blackish sepia, softened at the edges into a paler tint, and occasionally running into bluish grey, which underlies the dark colour in large blotches or clouds. Other eggs are similarly marked with smaller blotches, and some are sparingly covered throughout with small spots of deep red-brown. Dimensions of different specimens are 2.11 by 1.41, 1.92 by 1.34, and 2.1 by 1.38 inches.

STERNA DOUGALLI

(THE ROSEATE TERN.)

Sterna dougalli, Mont. Orn. Dict. Suppl. (1813); Gould, B. of Eur. pl. 418 (1832); Legge, Str. Feath. 1875, p. 376, et 1876, p. 246; Saunders, P. Z. S. 1876, p. 652; Dresser, B. of Eur. pt. 54 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 492, et 1879 (List Ind. B.), p. 116.

Sterna paradisea, Keys. & Blas. Wirbelth. Eur. p. 97 (1840); Blyth, Cat. B. Mus. A. S. B. p. 292 (1849); Jerdon, B. of Ind. iii. p. 840 (1864).

Sterna gracilis, Gould, P. Z. S. 1847, p. 222; id. B. of Austr. vii. pl. 27 (1848); Holdsw. P. Z. S. 1872, p. 481 (first record from Ceylon); Hume, Str. Feath. 1874, p. 317.

Sternula korustes, Hume, Str. Feath. 1874, p. 318.

Sterne de Dougall, French; *Paradies-Meer-Schwalbe*, German; *Graceful Tern*, Gould.

Adult male (Ceylon, June). Length 14.6 to 15.8 inches; wing 8.4 to 9.0, expanse 25.0 to 26.8; tail 6.5 to 7.7, depth of fork 4.0 to 4.5, lateral feathers in finest specimen 2.65 longer than the adjacent; tarsus 0.8 to 0.92; middle toe 0.7 to 0.75, claw (straight) 0.24, inner edge pectinated slightly; bill at front 1.23 to 1.4, to gape 1.8 to 1.95.

The lateral tail-feathers are very much attenuated in this species, extending in fine specimens 2.5 inches beyond the closed wing.

(18th June.) Iris brown; bill orange on the basal half, remainder of upper mandible blackish, of lower paler or brownish; legs and feet coral-red; claws red, tips dusky.

(30th June.) Bill jet-black throughout, claws the same.

American examples shot in July, in Mr. Dresser's collection, and a Port-Blair specimen (20th May) have the bill black, except round the base, where it is yellow. A September specimen (Elizabeth Island) has it entirely black.

Forehead, with the upper half of the lores, crown, nape, and upper part of hind neck glossy black, the boundary-line passing from the nostril along by the under edge of the eyelid (which, however, is white) and over the ear-coverts to the nape; hind neck just beneath the termination of the crest white, changing imperceptibly into the delicate pearly grey of the back, wings, rump, and tail, which latter fades again into white on the lateral feathers; primaries dark grey, thickly "frosted" with white on all the outer webs but that of the 1st, the inner portions of the inner webs white, *continued as a broad edge to the tips*; tips of the secondaries white; primary-shafts white to the tips; underparts suffused with delicate rosy white, tinged with pale grey on the flanks; axillaries pure white, but the under wing tinged with rose-colour. In examples not so far advanced towards breeding-plumage this rosy colour is not so pronounced, showing that it increases until the bill is at its blackest, and the individual has assumed its perfect nuptial attire.

Winter plumage. Bill red, tipped with black more or less; underparts white; the forehead, lores, and front of crown white; occiput and nape with the centre of the feathers black and the margins white.

Young, about three months old. Wing 8.2 inches; tail 4.2; bill to gape 2.6.

Bill black; legs and feet brown.

Head above mouse-colour, darkening on the nape, and spotted on the crown with black; a spot in front of the eye and a patch behind it black; cheeks just beneath the eye striped with black; hind neck and interseapular region finely stippled with brown and buff; uppermost scapulars more coarsely marked with the same; longer scapulars and tertials grey, passing into buff at the tips, and marked with blackish-brown centres and broad stripes running round inside the edge of the feathers; lesser wing-coverts blackish grey, tipped with white; remainder pale blue-grey; the greater coverts and the secondaries tipped white, the latter very broadly, the adjacent colour being blue-grey, passing into white at the base and on the outer web; quills as in the adult, with broader white tips; all but the outer tail-feathers with dark markings near the tips.

Obs. Measurements of birds from other parts of the world are:—(Massachusetts, Mus. Dresser) wing 9.1 to 9.2 inches; tail 7.8 to 8.5, outer feathers 4.8 to 5.6 longer than the central pair; tarsus 0.7; middle toe 0.7; bill to gape 2.0, at front 1.5: (Port Blair, Mus. Dresser) wing 8.4; tail 6.0; tarsus 0.7: (Andamans, *Hume*) wing 8.5; tail nearly 7.0, extending an inch (only) beyond the closed wing; tarsus 0.75; bill 1.45 at front.

Colour of bill. Mr. Hume's experience at the Andamans of the change in the colour of the bill is exactly the reverse of what mine is. He says the bills are blackish in April, changing to orange-red in May at the base; in June the terminal parts are dusky blackish, and in July the whole bill is orange-red. Now at the beginning of June (1875), when these Terns appeared at Trincomalie, all that I could see had reddish bills; and what I shot with such bills had abraded tails and but little rosy colour on the breast. At the end of June many that I saw on the wing had black bills, and what I shot with such bills were in magnificent and perfect plumage. The numbers I saw and those I shot may not have been sufficient to give me a true insight into the question, and therefore I will not assume that my opinion is the correct one, but merely call the attention of ornithologists to these facts with a view to adducing more evidence to show whether or not the colour of the bill is quite an untrustworthy character. It is noteworthy that the nearer we get to Australia the redder the bills appear to be. Gould's *Sterna gracilis* is founded mainly on the red bill as distinguished from the black one in European specimens. The series I procured in Ceylon exhibited a peculiar feature in having acquired the new primaries before the rectrices; the opposite is the case with all other Terns I have met with in that island.

Distribution.—In his catalogue of Ceylonese birds Mr. Holdsworth notices the capture of some Terns at Colombo in July 1869, one of which Mr. Howard Saunders identified as *S. gracilis*. In May and June 1875 large numbers visited the coast at Trincomalie and remained until the beginning of July, when they disappeared; and as Captain Wimberley found them breeding at Port Blair, South Andaman, in June, the Ceylonese visitants probably moved on there and bred in other parts of the islands. In 1873 the same gentleman procured it in the Andamans, and Mr. Davison sent a specimen thence to Mr. Hume. It appears therefore that it visits the Bay of Bengal at irregular times. It ranges south to Australia, chiefly frequenting the west, north, and north-east coasts down to the latitude of Wide Bay. At Noumea, New Caledonia, Layard has procured it, as also at Anseвата, where he found it breeding on New-Year's day. Mr. Gilbert met with it on the west coast of Australia, at the Houtmann's Abrolhos, in great numbers, and found it breeding there in the month of November. It probably occurs on the coasts of Sumatra and Java, though it has not yet been noticed in either of those islands. It is very rare on the coasts of India. Mr. Hume records it from one locality (Laynah creek) on the Tenasserim coast, where it occurred accidentally on one occasion. Mons. Dussumier procured an example on the Bengal coast; and at the mouth of the Indus Captain Butler was recently informed that a rosy-tinted Tern had been seen, which must have been this species. Between India and Europe it does not appear to have been noticed; and on the latter continent its distribution is by no means universal. I find no record of its occurrence at the eastern end of the Mediterranean, nor in Egypt or the Red Sea. It is very rare in Greece, and, according to Salvadori, has only once occurred in Italy, in Liguria, in June 1822. It has been shot in the Balearic Islands, but is not recorded from Spain. It is rare on the coasts of France, Holland, and the Baltic, and does not range to the north beyond lat. 57°, according to Mr. Saunders. It is perhaps more common in the British Isles than in most parts of the continent, for it breeds in Scotland and Ireland. In the former country it was first discovered by Dr. McDougall on the Cumbrey Islands in the Firth of Clyde, and named after this gentleman by Colonel Montagu. It breeds in Kilbrannan Sound, on Loch Lomond, in Morayshire, on Foulney Island, on the coasts of Cornwall, and in Ireland, according to Thompson, on Mew Island. On the east coasts of North America it is more common than in Europe, breeding from Massachusetts to Florida, including the island of Bermuda. It has been met with in the West Indies, and Mr. Salvin found it on the coast of British Honduras. Finally, in the Atlantic it occurs in the Azores, for Mr. DuCane Godman saw it at Fayal. It does not frequent the west coast of Africa; but it has been shot at the Cape of Good Hope and in Natal; and it is said to be found, writes Mr. Dresser, at Rodriguez.

Habits.—This lovely Tern, which may easily be distinguished from all others on the wing by its extremely elegant form and lengthened tail-feathers, is purely a sea-coast species, rarely being seen away from salt water, and seldom even frequenting backwaters and salt lagoons near the sea. It is not a swift bird in its ordinary flight; but nevertheless turns and twists about with the greatest ease and grace, and plunges sharply upon its prey. While proceeding along with light though measured strokes of its wings over the breaking surf, it will suddenly stop, wheel round, point its bill downwards, and seeing a fish will fall upon it like an arrow, its elegant form making but little splash in the foaming waters. At other times it will sweep gracefully down in a curve, and delve up the "fry" from the surface. Its long "streamers" are carried close together, so that the bird

appears on the wing to have an attenuated Parrakeet-like tail. It constantly utters a monosyllabic and not unmusical piping note; but when a pair are together they give out a harsh *crake*, very unlike the ordinary call. This Tern is decidedly a shy bird, for when numbers were fishing off the fort at Trineomalie with the Gull-billed and Common Tern they seldom came within shot of my position; and when I met with them flying along the surf they kept well out from the beach, except at dusk, when they would pass close to me.

Nidification.—The breeding-season in the northern hemisphere lasts from May till July; but on the coasts of Australia and in the Pacific, as we have seen, this Tern nests in the opposite season of the year. According to one authority (Captain Walker, of Belmont, Ireland) the nest is a little hollow in the sand, surrounded by a small hoop of about 3 inches in diameter, made of grass and neatly put together. No mention, however, of this curious construction is made by Dr. Heiberg, who found it breeding in Denmark, and concerning whose discovery Mr. Dresser publishes details from a correspondent in Copenhagen.

The eggs are said to be two in number; and a series I have examined are rather large for the bird, pointed ovals, and slightly rough in texture. Some are rather stumpy at the small end. They vary considerably in ground-colour, some being creamy white, others buff-brown and pale olivaceous stone. The markings are scanty in some and rather thickly distributed throughout the surface in others: one specimen before me has a zone of handsome blackish-sepia blotches round the obtuse end, under which are clouds of dark inky grey of two shades; another is rather closely marked with small blots of rich brown of two shades over dark inky-grey blots; a third has a few openly-distributed small spots of pale brown over larger, more numerous, and almost equally prominent blotches of bluish grey. The dimensions of several specimens in Mr. Dresser's collection are 1.64 by 1.19, 1.72 by 1.18, 1.68 by 1.19, and 1.68 by 1.08 inch.

STERNA FULIGINOSA.

(THE SOOTY TERN.)

Sterna fuliginosa, Gm. Syst. Nat. i. p. 605 (1788); Temm. & Schl. Faun. Jap. p. 133, pl. 89 (1842); Finsch & Hartl. Orn. Centralpolyn. p. 225 (1867); Sperling, Ibis, 1868, p. 286; Saunders, P. Z. S. 1876, p. 666, et 1877, p. 796; Hume, Str. Feath. 1876, p. 477; Dresser, B. of Eur. pt. 61, 62 (1877); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Onychoprion fuliginosus (Gm.), Gould, B. of Austr. vii. p. 32 (1848); Sclater & Salvin, P. Z. S. 1871, p. 572; Hume, Str. Feath. 1873, p. 140 (first record from Ceylon); Salvadori, Uccelli di Borneo, p. 373 (1874).

Hydrochelidon infuscata (Licht.), Heuglin, Orn. N.Ost-Afr. ii. p. 1457 (1873).

Haliplana fuliginosa (Gm.), David & Oust. Ois. de la Chine, p. 528 (1877).

Wide-awake of sailors.

Characteristics. *Bill from gape not less than 2·2 inches; black loreal stripe oblique; inner and middle toes fully webbed. Young brown beneath.*

Adult male and female (Atlantic). Wing 11·2 to 11·8 inches; tail 5·5 to 7·0, according to length of outer tail-feather, which is much attenuated; tarsus 0·8 to 0·95; middle toe 0·8, its claw 0·38, web of inner and middle extending to $\frac{1}{10}$ from the tip of the sole of the latter; bill to gape 2·3.

Adult male and female (Laccadives). Length 16·1 to 17·75 inches; wing 10·65 to 11·8, expanse 32·5 to 35·25; tarsus 0·9 to 0·93; bill from gape 2·3 to 2·4, at front 1·6 to 1·7. Weight of the largest specimen 8 oz. (*Hume*.)

Iris deep brown, almost black; bill, legs, and feet black.

Breeding-plumage (Ascension). Head and nape deep glossy black, the colour extending to within 0·3 inch of the base of the bill, and covering the sides of the head and upper part of the hind neck down to the level of the lower eyelid; forehead and upper part of the lores white, narrowing to a point above the centre of the eye, and leaving a border of black $\frac{1}{10}$ inch wide, which descends as a broad *oblique stripe* to the gape; entire upper surface and wings black-brown, darkening into black on the least wing-coverts, which are set off by a white border round the edge of the wing; outer web of lateral tail-feathers white, the inner greyish white, passing into brown at some distance from the tip; entire under surface white, sullied slightly with grey on the breast and abdomen.

Young, nestling in down (Ascension). Above mingled grey and brown, the tips of the down being of the latter colour, which is most conspicuous on the sides of the back, forming two stripes with a white interspace; forehead brown; head whitish, mingled with jet-black down, the whole being stiff and pointed, and not "decomposed," as on the back; wings as the back; beneath uniform whitish.

The young vary; two specimens from Houtmann's Abrolhos do not possess the white patch on the centre of the back, and one is much more closely mottled and altogether darker than the other.

Almost completely fledged bird. "Entire upper surface, sides of the neck and breast, and upper abdomen a deep sooty brown, almost black on the head and scapulars; all the scapulars and largest tertials tipped with white, and those of the interscapular region and all the wing- and upper tail-coverts tipped with rufescent buff." (*Hume*, Laccadives.)

Immature, first plumage (Brit. Mus.). Entirely brown, paler beneath and of a chocolate tint, the bases of the feathers white; feathers of the head crossed with minute bars of fulvous; interscapular region barred with buff-white, the markings increasing in width towards the rump and confined to the tips of the feathers; scapulars and tertials broadly tipped with white; wing-coverts less so, the least series blackish brown and unmarked; secondaries and tail-feathers tipped with dull white. Wing 8·6 inches. A *younger* bird, just fledged, is barred above in the same way, but has the throat whitish, striped with blackish.

Immature, about one year old (Ceylon, June and August, 2 examples). Wing 11·3 inches; tail 4·7 to 5·6, depth of fork 2·0; tarsus 0·85 to 0·9; middle toe 0·8 to 0·85; bill at front 1·6 to 1·7, to gape 2·3 to 2·35.

Iris dusky brown; bill black; legs and feet black.

Forehead greyish; entire upper surface black, with a greenish gloss in places; feathers of back edged with white; under surface brown, mixed with whitish chiefly on the throat and belly; flanks more uniformly dark than the breast.

Another example (Mount Lavinia, June) has the forehead whitish, with blackish spots or "points;" chin and gorge the same; throat brownish, lower parts pale whitish brown; under tail-coverts sullied white.

Obs. This species has frequently been confounded with the next; but the characters which I have given above will, in addition to its larger-sized bill, serve at once to identify it, should any of my readers procure specimens in Ceylon. Mr. Saunders was the first naturalist to point out the important difference in the feet of the two species.

Distribution.—The Sooty Tern has only recently been added to the avifauna of Ceylon. During the south-west monsoon of 1873 three examples were met with by Mr. Hart, the taxidermist of the Museum, on the little tank of Boralesgamuwa, about nine miles from Colombo, and one was shot which I sent to Mr. Hume for his inspection. Subsequently another specimen was captured in a net by fishermen at Mount Lavinia in August 1874, and a third was secured exhausted on the rocks at the same place in June 1876. I have not heard of any further occurrences of the species in the island, but it is no doubt much less rare than these few instances of its capture would lead one to infer; for among the thousands of its near ally, the Brown-winged Tern, which are seen on the coasts there must be a certain proportion of the present species.

Though Jerdon omitted this Tern from the Indian list, Mr. Hume says it is not uncommon right up the west coast of the peninsula, and northwards to the Mekran coast. He has seen it from near Panwell, in the Bombay Harbour, also from Tutul between Surat and Bombay, and also from Minicoy. In February 1875 he found it breeding in enormous numbers at the Cherbaniani reef in the Laecadives, and from the stock there raised doubtless come the individuals which occur on the west coast of Ceylon. It occurs throughout the Indian Ocean, having been met with at various parts on the east coast of Africa, and at the islands of Madagascar, Rodriguez, and Mauritius. Von Heuglin observed it on the Somauli coast, and Messrs. Finsch and Hartlaub in the northern half of the Red Sea. It is abundant on the west coast of Australia, breeding in great numbers in December at the Houtmann's Abrolhos, near Perth. Mr. Ramsay records it from the South Australian, Victorian, and New South Wales coasts, and from Rockingham Bay, Cape York, and Port Darwin. Macgillivray found it breeding in Torres Straits in May and June; and this difference in the time of its nesting on the Australian coasts is very noteworthy. It is doubtless an inhabitant of the seas surrounding many of the Pacific islands, as I find it recorded from New Caledonia, from the Samoa Islands, the Marquesas, the Rosa and Honden Islands, and from Ponape in the Seniavin group. In the Malay archipelago it has been obtained, writes Salvadori, off the coasts of Sumatra and Borneo; and northwards it occurs along the China coasts to Japan, where, however, it appears to be very rare. Père David says that he has seen it in the interior of China "going west, doubtless towards the great lakes of Central Asia;" but there appears to be some mistake in this naturalist's identification, as this truly oceanic bird could not have been seen on its way to Central Asia.

Turning now towards the Atlantic, we find it recorded from the Gold Coast and from Senegal; and at St. Helena, where I have seen it, it is tolerably plentiful. At Ascension it breeds in great numbers at certain spots in the island termed "Wide-awake Fairs." They arrive for breeding purposes about October, and do not leave sometimes until May, in which month I saw great numbers there in 1877. Their visits, however, are not regular, for Captain Sperling found them breeding in June. It is an occasional straggler as far north as Europe. Mr. Dresser enumerates four instances of its occurrence, two of which were in England, viz. one at Burton-on-Trent, October 1852, the other at Wallingford, Berks, June 1869; a third was obtained at Magdeburg, in Germany, and a fourth at Verdun, in France. It is common on the east coast of America, being most abundant in tropical parts. Mr. Dresser met with it in Texas, and it is very numerous on the Florida Keys. It has been obtained at Bermuda; and in the West Indies it is found on the Cuban and Jamaican coasts, and breeds at St. Thomas's. On the western side it wanders as far south as Chili, and northwards to the Aleutian Islands.

Habits.—This Tern is exclusively an oceanic species, never straying inland, except during the prevalence of strong winds. It may be seen at great distances from the land, though it is not so much at home as the Noddies in mid-ocean, and when seen there has the appearance not so much of wandering about as of making its way to some distant land, and merely flying round the ship, on the look-out for food thrown overboard. When I have met with it fishing it has generally been within twenty miles of the land. Being a bird of very powerful flight it no doubt travels long distances in search of food, particularly when it has young to feed; for I find it noticed by Mr. Penrose, in his paper "On the Birds of Ascension," that one was caught with a fish in its bill which was unknown in those waters. I have observed it sweeping down rapidly to the surface of the water and dipping up its prey as it were, but I have not noticed it pouncing. It adroitly twists and turns and contrives often to avoid the attacks of its enemy, the Frigate-Bird, which I have seen dashing headlong at it in order to rob it of its well-earned food. It has a loud scream, which I omitted to syllabize when listening to it, but which Audubon likens to the syllables *ooee oo-ee*; and he says that when seized or wounded it utters a plaintive cry, differing from the ordinary note. Its food consists of fish, cephalopods, floating animalculæ, &c., besides which it will pick up various substances thrown overboard from ships.

Nidification.—The Wide-awake breeds, as a rule, in vast colonies on small islands or reefs, many such breeding-places having been discovered within the last fifty years. The following are known to me; and as far as I am able I have given the dates, from which it appears that the breeding-time varies at different places from December until August:—Cherbaniani reef, Laeacadives (February); Houtmann's Abrolhos, W. Australia (December); Torres Straits (May and June); Raines Island Barrier Reef (August); Ascension (December and June); St. Thomas's, West Indies; Florida Keys. The eggs are laid in a depression in the sand scratched by the bird, and often near the shelter of a bush; they vary from one to three in number, and while the bird is sitting on them she will suffer herself to be taken by hand, hissing and biting at the intruder. Mr. Hume gives an interesting account of his visit to Cherbaniani, and states that the ground literally swarmed with young ones, which ran about between his feet in such a manner that it was difficult to avoid treading on them. On taking some young back to the reef on the following day, the parents, amidst thousands of birds, immediately found out their lost offspring! The eggs of the Sooty Tern vary much, both in ground-colour and marking: some are almost pure white, and many different tints are observable between that and the pale salmon-colour of others. They are, as a rule, broad, rather pointed, ovals, the shell moderately smooth and with scarcely any gloss. The markings are very handsome, the whitest eggs being covered with openly distributed roundish blotches of rich brownish red, or clouded with the same round the obtuse end, there being but few small spots on this latter type, but numerous clouds of purplish grey underlying the dark markings. Some white eggs are blotched throughout with obliquely-directed blots of a redder tint running into purplish grey. In others the blotches take a transverse direction: one specimen, in the fine series before me from Ascension Island, is smeared all over with light reddish washed-out blotches, mingled with streaks and scratches of the same, with large underlying clouds of bluish grey. The dimensions of various specimens are as follows:—2.19 by 1.43, 1.97 by 1.46, 2.17 by 1.39, 2.03 by 1.35, 1.84 by 1.35, and 2.05 by 1.39 inches. The variation in shape will be thus observed; some specimens are rather blunt at the small end.

I here subjoin some extracts from the accounts given by Audubon and Captain Sperling of the interesting breeding-places of this bird. The latter writes, concerning Ascension:—"Leaving Comfortless Cove about the middle of the day, I walked over two dreary miles of cinders and ashes, uncheered by a symptom of vegetation, before I noticed flocks of Terns converging from various parts of the ocean to a spot apparently about a mile in front of me; but as yet I observed nothing of the 'fair'; at length, on turning slightly to the left and surmounting a low ridge, the whole scene was disclosed. A gradual incline of a quarter of a mile terminated in a plain of ten or fifteen acres in extent, which was literally covered with the birds. The plain was surrounded by low mountains, except on the side on which we stood; and being entirely sheltered from the wind, its heat under the full blaze of a tropical sun was very oppressive. No description can give an adequate idea of the effect produced by the thousands upon thousands of these wild sea-birds floating and screaming over this arid cinder-bed, the eggs and young scattered so thickly on the ground that in some instances it was impossible to avoid crushing them and the bleached bones of dead birds distributed in all directions. During our short walk down the incline, large flocks of parent birds hovered over our heads, and assailed us with plaintive cries,

regardless of our sticks, with which we might have killed any number of them ; but their beautiful pure dark and white plumage and graceful motions caused it to appear almost a sin to knock any of them down. On arriving within the precincts of the breeding-grounds their numbers increased ; large flocks were arriving in endless succession from seaward ; clouds of birds rose from the ground, and, joining those already attending us, their wheelings and gyrations almost made us giddy. I sat down on a lump of cinder ; and the society, being at length convinced that my policy was not aggressive, went on with the ordinary routine of incubation. There were young of all sizes, from the little callow ones just hatched to the nearly fledged birds that fluttered and crawled like young pigeons. There were also lots of eggs exposed on the bare ground ; but in most instances the old bird sat on its solitary treasure, hissing defiance as I approached, and fighting manfully if I attempted to remove it."

Audubon's charming account of his visit to Florida Keys displays so much of the wonderful powers of observation for which that great naturalist was so celebrated, that I cannot forbear giving the following extract from the 'Birds of America,' vii. p. 252:—"Here and there, in numerous places within twenty yards of me, females, having their complement of eggs, alighted, and quietly commenced the labour of incubation. Now and then a male bird also settled close by and immediately disgorged a small fish within the reach of the female. After some curious reciprocal nods of their heads, which were doubtless intended as marks of affection, the caterer would fly off. Several individuals which had not commenced laying their eggs, I saw scratch the sand with their feet, in the manner of the common Fowl while searching for food. In the course of this operation they frequently seated themselves in the shallow basin to try how it fitted their form, or find out what was still wanted to ensure their comfort. Not the least resemblance of a quarrel did I observe between any two of these interesting creatures ; indeed they all appeared as if happy members of a single family ; and, as if to gratify my utmost wishes, a few of them went through the process of courtship in my presence. The male birds frequently threw their heads over their backs, as it were, in the manner of several species of Gulls ; they also swelled out their throats, walked round the females, and ended in uttering a soft puffing sound as they caressed them. Then the pair for a moment or two walked round each other, and at length rose on wing and soon disappeared. It was curious to observe their actions whenever a large party landed on the island. All those not engaged in incubation would immediately rise in the air and scream aloud ; those on the ground would then join them as quickly as they could, and the whole, forming a vast mass with a broad extended front, would, as it were, charge us, pass over for fifty yards or so, then suddenly wheel round, and again renew their attack. This they would repeat six or eight times in succession. When the sailors, at our desire, all shouted as loud as they could, the phalanx would for an instant become perfectly silent, as if to gather our meaning ; but the next moment, like a huge wave breaking on the beach, it would rush forward with deafening noise."

STERNA ANÆSTHETA.

(THE BROWN-WINGED TERN.)

*Sterna anæthetus**, Scop. Del. Flor. et Faun. Ins. i. p. 92 (1786), *ex* Sonnerat.

Sterna panayensis, Gm. Syst. Nat. i. p. 607 (1788).

Onychoprion panayana (Lath.), *apud* Gould, B. of Austr. vii. pl. 33 (1848).

Onychoprion anæthetus (Scop.), Blyth, Cat. B. Mus. A. S. B. p. 293 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 844 (1864); Hume, Str. Feath. 1874, p. 320; Salvadori, Uccelli di Born. p. 374 (1874).

Hydrochelidon anæthetus, Scop., Heuglin, Orn. N.Ost-Afr. ii. p. 1453 (1873).

Sterna anæsthesa, Scop., Legge, Str. Feath. 1875, p. 377; Hume, *ibid.* 1876, p. 474; Saunders, P. Z. S. 1876, p. 664; Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Sterna fuliginosa, Gm. *apud* Legge, Str. Feath. 1875, p. 378.

Hirondelle de mer de l'île de Panay, Sonn. Voy. N. Guin. pl. 86 (1776); *Panayan Tern*, Lath.; *Brown-winged Noddy* of some.

Liniya, Sinhalese.

Characteristics. *Loral stripe horizontal from eye to bill; back paler than the wings; inner web of foot not extending beyond the last joint of middle toe. Young white beneath.*

Adult male and female (Ceylon, breeding-plumage). Length 14·0 to 15·3 inches; wing 9·8 to 10·5, expanse 29·0 to 30·0; tail 6·3 to 7·0, outer tail-feathers attenuated and sometimes 2·0 longer than adjacent pair; depth of fork in such 4·5; tarsus 0·7 to 0·8; middle toe and claw 1·08 to 1·2; bill to gape 1·9 to 2·1, at front 1·6 to 1·7.

Iris deep brown; bill black, extreme tip pale horny; legs and feet black.

Forehead and a broad stripe extending over each eye white, the frontal portion being narrower than in the last species; centre of the forehead, crown, occiput, and nape glossy black, descending behind the eye to a level with its lower edge; a broad black band from the eye *straight forward* to the bill, and not taking an oblique direction down to the gape; hind neck greyish white, tinged on the lower part with ashy, and passing into the smoke-brown of the mantle, scapulars, and upper tail-coverts and tail, all of which parts are pervaded with an ashy hue, varying according to the individual; wing-coverts and tertials darker smoke-brown than the back, edge of the wing white; primaries with their coverts and secondaries black-brown, the shafts chocolate-brown, but white beneath; lateral tail-feathers white, with the exception of the extreme tip and the terminal portion of the inner web; beneath white, the chest, breast, flanks, and abdomen more or less tinged with ashy grey; axillaries and under wing pure white.

Winter plumage (August, Ceylon). Lores, forehead, front of crown, and over the eye white; feathers of the crown and occiput edged with white, the centres blackish brown; nape-feathers finely tipped with white; a black spot in front of the eye, before which the feathers forming the stripe in summer are greyish; hind neck slaty, with the margins of the feathers greyish; feathers of the back, rump, and upper tail-coverts tipped indistinctly with slaty grey; outer webs of the lateral tail-feathers dark for $2\frac{1}{2}$ inches or more from the tip; under surface pure white. In some examples with unmarked wing-coverts the mantle-feathers are very broadly tipped with white; these are probably birds in their second winter.

Specimens shot in April and May are in change, acquiring the black loral and coronal feathers. Many are, however, in full breeding-plumage by the end of April.

Young (October and November, Colombo). Length 12·0 to 13·5 inches; wing 9·8 to 10·0; tail 5·0 to 5·5; tarsus 0·8; middle toe 0·9, claw (straight) 0·3; bill to gape 2·0 to 2·15.

Iris brown; bill black, inside of mouth white; legs and feet livid brown, in some bluish brown.

* The omission of the "s" is doubtless a printer's error, and should not be followed now.

About four months old (October). Head much as in the adult in winter, but the lores darker, and the dark feathers encroaching on the forehead and tipped with buff-white, and the nuchal feathers broadly tipped; just behind the eye uniform black, passing under the eye; hind neck grey; mantle and rump broadly tipped with white, passing into the brown with an ochraceous hue; scapulars more deeply tipped still, and the ochraceous division more noticeable; wing-coverts less conspicuously tipped with white; tail tipped as the scapulars, the outer feathers entirely brown. Some examples have very little white on the forehead. Birds a month older than the above show less of the ochreous-brown coloration, and the white tipplings are to some extent worn off; but no rule can be established, as seldom two birds are alike, particularly about the head.

Obs. The extent of the white over the eye varies: in some specimens it is produced quite beyond the posterior edge of the eyelid. There is also no little variation in the coloration of the hind neck, some specimens being much paler than others, and occasionally quite white. A very fine female in breeding-plumage, from Paternoster Island, measures:—length 15.5 inches; tail 8.4, outer tail-feathers 5.0 longer than the central; bill to gape 2.0; the inner web joins the middle toe at the centre of the 2nd phalange, this being the most deeply excised foot I have met with in any specimen examined.

Sterna albigena, Licht., an interesting, slender-billed, grey-plumaged Tern, inhabiting the Red Sea and northern part of the Indian Ocean, has recently been killed at the Laccadives, and therefore may occur in Ceylon at some future time. Mr. Hume gives the dimensions of a male as:—length 14.5 inches, wing 9.9, tail 6.5, tarsus 0.77, middle toe and claw 1.04, bill to gape 2.15. In *summer* the bill is coral-red, blackish at the tips and base of culmen; legs and feet bright coral-red; iris brown; wings exceeding the tail by 3 lines (*Heuglin*). Above bluish grey; front and sides of the neck, breast, and abdomen purplish grey; chin and upper part of throat whitish; lores and beneath the eye snowy white. In *winter* the bill is reddish black, and the legs and feet Indian red. Back, scapulars, and tail dark French grey, and the breast and abdomen dusky bluish grey; lores and forehead white, and the crown whitish, spotted with black (*Hume*). The red legs are a good distinguishing character.

Distribution.—The Panayan Tern is exceedingly numerous on the coasts of Ceylon at certain seasons of the year. It appears on the west coast, when there is a strong wind blowing on shore, from May till October, and again in April and May at the commencement of the south-west monsoon. At these periods it may be seen in the Colombo Roads and in the inner harbour flying about in search of garbage, and alighting on the little wooden buoys used by the native vessels. In August 1874 great numbers visited the port; and in October 1876 it was more numerous still, the majority of the birds being quite young. In the former year I saw great numbers at the Basses, and the following day (in August) a good many in the Batticaloa Roads. At Trincomalee I have chiefly noticed it in December and in April and May, at which dates it used to appear for a few days and then move away. At Galle it was numerous in October and November in 1878, but was not much seen in the daytime, making itself known by its incessant cries at night. Layard appears only to have met with three specimens at Pt. Pedro while out at sea dredging; and Mr. Holdsworth does not seem to have seen it at all on the Pearl Banks of Aripu. It must also be admitted that, though abundant on the coasts in some seasons, its visits are uncertain, for in 1868–69–70 I saw nothing of it at Colombo. It most probably wanders over the Indian Ocean in vast flocks, visiting various localities *en route*.

Like the last, this species has a very wide intertropical range, but does not seem to be found in central-Atlantic localities, like the Sooty Tern; for though it is recorded from Honduras and the West Indies, and from the west coast of Africa, I do not find any mention of its occurrence at Ascension or other Atlantic islands; and it has not strayed into Europe, like the latter bird. In the Indian Ocean, from the east coast of Africa, Madagascar, Mauritius, Réunion, and Seychelles, across to Western Australia and northward to Bombay and the Bay of Bengal, it is perhaps more abundant than in any other seas. It breeds in great numbers on the Vingorla rocks off the Bombay coast, and thence no doubt visits Ceylon. It has been met with between Bombay and Kurrahee, and in the Bay of Bengal it occurs on all the islands in the monsoons. In the Mergui archipelago it is believed to have been seen, but nowhere else on the coast of Tenasserim. In the Malay islands it is recorded from Sumatra, Java, Borneo (Pontianak), Moluccas, and Celebes; and from the Philippines it was made known by Sonnerat. It has been met with on the south coast of New Guinea, in Torres Straits, at Port Darwin, Cape York, Rockingham Bay, down the whole of the east coast to Victoria, and thence to South Australia; and on the coasts of Western Australia it breeds at the Houtmann's Abrolhos. It is found at some of the Pacific islands, including the Sandwich, also the Fiji group, where Layard has

recently procured it, and extends northward to Japan, where it is apparently a rare straggler. It has been found on the Pacific coasts of America; and there is a specimen in the Norwich Museum from the Aleutians, alluded to by Von Heuglin.

Habits.—The Brown-winged Tern is purely an oceanic species, and is a bird of buoyant and rapid, though not very powerful, flight; for it is invariably driven from its maritime haunts to the shore in high winds, and is often in such an exhausted state that it may be taken by hand from the rigging of vessels, from the gunwales of boats, and from any prominent object on piers and wharves, where it will alight, seemingly quite regardless of its natural enemy, man. I have taken it myself from the awning of a steamer in the Colombo Roads, and have seen it captured while sitting on the gunwale of a canoe in the harbour. Mr. Hume testifies to its being frequently thus taken on ships in Indian waters; and probably, as is the case in Ceylon, the specimens thus procured are immature. When caught their stomachs are often quite empty. While taking its food or capturing small fish, such as sardines &c., it flies along the water, almost touching the surface, and darts down its bill as it proceeds; at times it hovers over a fish, and, descending rapidly to the water, takes it up as described, but does not pounce on it. On stormy nights great numbers are attracted by the lights of maritime towns, and pass many hours in wheeling round and round in the air, uttering their far-sounding notes. These sounds I heard at Galle, Trincomalie, and Colombo for several years before I identified the bird, as while on the wing by day it is silent; but one evening, on the new breakwater at Colombo, I was attracted by the familiar and unidentified note, and found a young bird sitting on a balk of timber screaming lustily, perhaps to its fellows who were flying about in the harbour. This note may be syllabized by *ker krēe, tree tree*, which, when uttered by a number of birds together, has a peculiarly consonant and grating sound. It feeds much on garbage and refuse thrown out of ships. Von Heuglin writes that it avoids flat coral islands, and frequents precipitous islands and cliffs; and further notices that on moonlight nights it is about until very late.

Nidification.—The last-mentioned author found this species breeding on cliffs near Djedah, on the Arabian coast of the Red Sea, in June. Each clutch consisted of two eggs, laid on the bare cliff, often between stones. Mr. Hume found thousands of addled eggs in February on the Vingorla rocks amongst the grass, together with numbers of dried-up mummies of old and young birds, which seems to indicate that the birds, which evidently breed during the height of the monsoon in June, must have been driven away from their stronghold by boisterous winds, leaving their offspring and eggs to the mercy of the weather. Eggs of this species from the Red Sea, in the collection of Mr. Howard Saunders, are pale reddish grey, pinkish, and greyish white in ground-colour, oval in shape, and marked with small spots and specks of light red, brownish red, or dark red-brown over blotches of light bluish and purplish grey; one egg is marked with large blotches of pale pinkish grey. Examples measure 1.75 by 1.28 and 1.75 by 1.17 inch.

The accompanying woodcuts, for the use of which I am (with the consent of Mr. Howard Saunders) indebted to the Zoological Society, show the difference in the feet of the last two species.



Foot of *Sterna fuliginosa*.



Foot of *Sterna anæstheticus*.

Genus ANOUS.

Bill long and slender, but with the gonys well marked. Wings long. The *tail cuneate*. Feet fully webbed.

ANOUS STOLIDUS.

(THE COMMON NODDY.)

Sterna stolidus, Linn. Syst. Nat. i. p. 227 (1766).

Sterna senex, Leach in Tuckey's Expedition to Congo, App. p. 408 (1818).

Anous stolidus (Linn.), Gould, B. of Austr. vii. pl. 34 (1848); Blyth, Cat. B. Mus. A. S. B. p. 293 (1849); Jerdon, B. of Ind. iii. p. 845 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1459 (1873); Salvadori, Uccelli di Born. p. 379 (1874); Legge, Str. Feath. 1876, p. 247 (first record from Ceylon); Saunders, P. Z. S. 1876, p. 669; Hume, Str. Feath. 1876, p. 478, et 1879 (List B. of Ind.), p. 116.

Adult (Ceylon). Wing 10·75 inches; tail 6·0; tarsus 1·0; middle toe 1·5; bill at front 1·75, to gape 2·1.

Adult male and female (Laccadives). Length 15·62 to 16·5 inches; wing 9·9 to 10·8; tail 5·8 to 6·35; tarsus 0·99 to 1·05; bill at front 1·65 to 1·76, to gape 2·25 to 2·4 (*Hume*). The smaller dimensions relate to females.—*Adults* (Atlantic, Indian, and Pacific oceans; Mus. Saunders). Wing 10·2 to 11·4 inches; tail 6·0 to 7·0; tarsus 0·97 to 1·02; middle toe (without claw) 1·27; bill at front 1·54 to 1·8. *Female* (Mus. Dresser). Wing 10·5; tarsus 1·0; middle toe 1·3, its claw 0·3; bill to gape 2·15, at front 1·7.

(Laccadives, February.) Iris deep brown; bill black, orange at the gape; legs and feet dusky vinous purple, webs paler; claws black (*Hume*). In a specimen shot in June in Ceylon the bill was entirely black, the legs and feet dark fleshy brown, and the webs pale fleshy.

Adult. Forehead and *front of crown* white, passing gradually into greyish white on the crown and thence into very pale grey on the nape, which darkens imperceptibly into the smoky brown of the neck and upper surface; neck and throat slightly pervaded with grey, and the entire under surface a somewhat more earthy or chestnut colour than the upper; face round the gape slightly darker than the throat, and a black spot just in front of the eye, the white of the forehead terminating abruptly against this spot and the brown of the lores in front of it; centre of the upper eyelid and all the lower half white; lesser wing-coverts darker than the rest; primaries and secondaries brownish black; tail not so dark, but black at the tips of the feathers: under wing-coverts very dark smoky grey.

The forehead and front of crown are whiter in some specimens than in others, the older birds being probably the whiter; the whole head and nape are in such specimens proportionately pale; the upper surface in a series of specimens before me varies from dark brown to reddish brown. Specimens from the Atlantic seem to be darker than those from other parts. The extent of the dark spot in front of the eye varies, running forward in some as a line bordering the white of the forehead nearly to the bill.

Young, almost fledged (Mus. Saunders). Feathers dark smoky brown throughout, without any pale tippings; throat, nape, breast, and belly in white down; the forehead as dark as the crown.

Immature (Cocos Islands). Forehead completely brown; back and wing-coverts brown; throat darker brown; under surface pale smoky brown, fading to greyish on the belly. In an example from the Pacific in moult from the first plumage the forehead is white, not grading into the *dark colour of the crown*, but sharply defined against it, and dark feathers are mingled with the white.

Obs. The stout bill and short gonys serve to distinguish this species from its allies.

The Noddy inhabiting the Indian Ocean, which comes nearest to the present bird, is *A. tenuirostris*, Temm. It

differs in its more slender bill, with the gonys longer than in *A. stolidus*; the forehead and crown are whitish grey, there being no difference in hue, whereas in the Common Noddy the crown is not so white as the forehead; again, the whitish hue of the forehead descends upon the lores, leaving merely a black border in front of the eye; the hind neck is pale grey, slightly darker than the crown; the chin blackish brown; the bill varies from 1.5 to 1.7 at front, and the wing from 8 to 9 inches. *A. leucocapillus*, Gould, appears to wander north from Australia into the Indian Ocean. It is a species with a white forehead and head, and very dark, almost black, lores; the dark brow of the ear-coverts, sides of neck, and nape is sharply defined against the white of the head; the wing is slightly longer than in *A. tenuirostris*, 9.0 to 9.5 inches; the bill slender, but with a shorter gonys than in the last-named bird.

Distribution.—This widely distributed Noddy has only recently been added to the avifauna of Ceylon. On the occasion of its visit to the island, which was on the 5th of June, 1876, a flock of four individuals were seen flying along the Galle-face beach in the morning by the taxidermist of the Colombo Museum, who shot one of them, which is now preserved in the collection of that institution. As the species breeds in the Laccadives it is singular that it is not seen on the west coast during strong westerly winds, the only explanation being that before the S.W. monsoon sets in in May the birds have left the breeding-place and are scattered over the Indian Ocean. I have seen Noddies on more than one occasion a day or two's sail south of Point Galle, which probably belonged to this species, and Père David met with thousands not far from Ceylon in July 1870. The Common Noddy has a very wide range, occurring right round the world in tropical waters, and straying as far north in the Atlantic as the British Isles, in the Pacific up to Formosa, and in the Indian Ocean as high as the Gulf of Oman and the Bay of Bengal, in which latter waters it is common, being found as far north as the Sandheads. It is met with occasionally at the Andamans, and on the opposite side of the peninsula affects some of the coral islands of the Laccadive group in great numbers, breeding at the Cherbaniani reef; further north Captain Butler saw it along the Mckran coast. In the Red Sea it ranges as far north as the tropic, beyond which Heuglin states that he has not seen it. Off the Somauli coast, according to this author, the numbers which frequent rocky islands and cliffs is quite incredible. Along the tropical shores of Eastern Africa it is common, extending to the Seychelles, Madagascar, Mauritius, Réunion, and Rodriguez. On the eastern confines of the Indian Ocean it is abundant along the shores of Australia, and ranges round the southern coasts to South Australia and Victoria, although it has not been noticed on the Tasmanian coasts. In the north of the continent it is recorded from Port Darwin, the Gulf of Carpentaria, and Cape York, extending from the latter all down the east coast. At Raine's Island the naturalists of the 'Challenger' found it breeding, and also met it abundantly at the Admiralty Islands. I find it is not uncommon in the Pelew Islands, and from the Philippines it has been once recorded. Elsewhere it has been met with at the Caroline Islands, at Ponape in the Seniavin group, in New Caledonia, Tahiti, and many other Polynesian islands. It is found also at the Galapagos Islands and on the tropical portions of both coasts of the continent of America. In the Atlantic it has been procured at Ascension, where it breeds in limited numbers, also at St. Helena and Tristan d'Acunha, which is its furthest limit towards the south—its most northerly range being the vicinity of the British Isles, in the avifauna of which it is included.

Habits.—Dwelling almost entirely upon the ocean, over whose wide expanse they roam in search of subsistence, the Noddies resemble the Petrels more than the Terns in their mode of life. They are birds of swift and enduring flight, but keep, as a rule, near the surface of the water, though they do not "shear" over the waves in the same manner as the Shearwaters. They fly like other Terns, but when they espy their food they settle on the water like Petrels to pick it up. This species feeds on mollusks, oily matter, garbage, and other substances which it finds floating on the sea. I have never heard their note, though I have often seen them, and I imagine that, except in the breeding-season, the Noddies are very silent birds.

Nidification.—The Common Noddy breeds in large colonies, laying at various times of the year, according to season, in the part of the world it resorts to. The nearest breeding-place to Ceylon is in the Laccadives, where Mr. Hume found it nesting in great numbers at the Cherbaniani reef in February. In the southern hemisphere it breeds at the Houtmann's Abrolhos and at Raine's Island in August, and also in the same

month at St. Paul's rocks in the Atlantic. At Ascension, however, and in British Honduras it breeds in the early part of the year.

I append here the following account by Mr. Gilbert, taken from Mr. Gould's work, of the breeding of this species at the Houtmann's Abrolhos, a group of islets lying off the west coast of Australia in lat. 28° S.:—"It lays its eggs in November and December, on a nest constructed of seaweed, about 6 inches in diameter and varying in height from 4 to 8 inches, but without any thing like regularity of form; the top is nearly flat, there being but a very slight hollow to prevent their single egg from rolling off. The nests are so completely plastered with the excrement of the bird, that at first sight they appear to be entirely formed of that material; they are either placed on the ground in a clear open space, or on the tops of the thick scrub, over those of the *Onychoprion fuliginosus*, the two species incubating together with the most perfect harmony, and the bushes presenting a mottled appearance from the great numbers of both species perched on the top On walking among the nests I was surprised to observe the pertinacity with which the birds kept their post; in fact they would not remove from off the egg or young, but would suffer themselves to be trodden upon or taken off with the hand; and so thickly were the nests placed, that it was no easy matter to avoid crushing either eggs or birds at every step." Mr. Gilbert says that numbers of the young are killed by a small lizard abundant on the island, and which extracts the brains and vertebral marrow, so that not more than one out of every twenty hatched reaches maturity.

The eggs of this Noddy are a delicate reddish white, rather rough in texture and pointed ovals in shape, very sparingly marked with small specks of brownish red round the larger end, or with a few larger blots of the same sparingly scattered over the whole surface; beneath these markings are faint spots of delicate bluish grey. Some examples in a series before me, belonging to Mr. Dresser, and taken in British Honduras, measure 1.87 by 1.35, 2.05 by 1.41, and 1.96 by 1.36 inch.

There are many other breeding-places of this Noddy throughout the world; some are in the Pacific, two of which, at Niuafoa and Eua Islands in the Friendly group, are cited by Dr. O. Finsch. It probably breeds at Rodriguez, and also, according to Heuglin, in the Red Sea.

G A V I Æ.

LARIDÆ.

Subfam. LARINÆ.

Bill stout, of moderate length; tip of the upper mandible curved; the gonys short and angulated; nostrils oblong and pervious. Wings when closed exceeding the tail. Tertiaries not exceeding the 6th primary. Tail short and even, or slightly cuneate. Tarsus longer than the middle toe and claw; the anterior scutes transverse and broad; toes fully webbed; hind toe rudimentary in one genus.

With a change of plumage in summer, acquired by a moult, chiefly on the head. Of natatorial habit.

Genus LARUS.

Characters of bill and wings as in the subfamily. Tail short and even at the tip; webs complete; hind toe present and not rudimentary.

LARUS ICHTHYAËTUS.

(THE GREAT BLACK-HEADED GULL.)

Larus ichthyaëtus, Pallas, It. ii. App. no. 27 (1776); Blyth, Cat. B. Mus. A. S. B. p. 288 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Shelley, B. of Egypt, p. 307, pl. 13 (1872); Dresser, B. of Europe, pt. 18 (1873); Hume, Str. Feath. 1873, p. 276, et 1879, p. 115 (List B. of Ind.); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1401 (1873); Legge, Str. Feath. 1875, p. 375; Saunders, P. Z. S. 1878, p. 198.

Kroikocephalus ichthyæetus (Pall.), Jerdon, B. of Ind. iii. p. 831 (1864).

Croicocephalus ichthyaëtus (Pall.), Holdsw. P. Z. S. 1872, p. 480.

Adult (Caspian). Wing 18·3 inches; tail 6·5; tarsus 3·0; middle toe and claw 3·4; bill to gape 3·5.
(Volga.) Wing 19·5 inches; tail 8·6; tarsus 3·1; middle toe 2·3, its claw 0·5; bill to gape 4·0, depth 0·9.

Adult male (Sindh). "Length 29·95 inches; wing 19·5; tail 7·5; tarsus 3·2; middle toe and claw 2·55; bill from gape 3·8; weight 2 lb. Wing in 12 males 19·0 to 20·0; in 5 females 18·5 to 18·9." (Hume.)

Breeding-plumage. Iris brown; gape and eyelids vermilion; bill rich orange or wax-yellow, with a black bar across both mandibles between the tip and the gonys; "legs and feet rich yellow, with a greenish tinge" (Tristram).

Entire head and throat to the level of just beneath the nape glossy black, sharply defined all round against the white of the neck and entire under surface, the tail and its coverts; back, interscapular region, and wing-coverts delicate blue-grey; scapulars and tertials tipped with white; primaries and their coverts white, the 1st quill with a black edge to within $2\frac{1}{2}$ inches of the tip, adjacent to which is a black band across the inner web; at the same position there is a black band across the next four quills, more extensive on the outer web than the inner; 6th primary with a black mark on the inner web near the tip.

In specimens which are probably very old the edge only of the outer web of the 1st primary is black.

Winter plumage. Bill yellower than in summer, the terminal portion orange-red.

Head, face, and throat white, a black bordering in front of the eye; nape and sides of the head behind the eye marked with dusky grey streaks.

The summer plumage is donned very early in the season. Mr. Hume writes that specimens shot in Sindh in the latter half of January had white throats, and some of them slightly blackish-mottled caps; but others killed at Muscat in the middle of February "were in the fullest breeding-plumage, the whole head and neck all round being velvet-black."

Young, in down (Volga: coll. Saunders). Bill black, with the tip yellow; legs and feet brown.

Entire upper surface dingy white, tinged with fulvous; throat tinged with grey; under surface white.

Plumage of first winter (Ceylon). Head and all beneath white, with a dark spot in front of the eye; the hind neck and back, with the bases of the feathers, pale, the central portions pale earthy brown, and the tips fulvous; scapulars ochraceous brown, with fulvous-white tips; lesser wing-coverts dark grey-brown; median coverts brown, paling into ochraceous brown, and thence into greyish at the margins; greater series ash-brown, darker in the centre, and with whitish margins; primaries and their coverts blackish brown, paling to whitish at the bases of the inner webs, with the tips of the shorter feathers white; secondaries glossy unber-brown, the major portion of the inner webs, the tips for about half an inch, and the terminal portion of the edge of the outer webs white; sides of rump, upper tail-coverts, and two thirds of the tail from the base white, the extreme tips of all the feathers white; under tail-coverts with a black bar $\frac{3}{4}$ inch from the tip, reduced on the lateral feathers to an oval spot on the outer web; under wing brown along the edge, the median series of feathers spotted with the same.

Bill dark brown, paling behind the nostril and at the base of the lower mandible; legs and feet dusky yellow.

In the second year, judging from a specimen before me, killed in Ceylon while moulting, the hind neck is spotted with

dark ashy grey, passing on the lower part into ashy brown, overspreading the feathers to the edges, which are ashy grey; mingled with these are the earthy-brown feathers of the first plumage, and a portion of the mantle consists of the adult bluish-slaty feathers; the wing-coverts are dark; but in other specimens which I have examined in this stage they are less brown, the median series consisting of slaty feathers; the tail-band is not so broad, and the under tail-coverts are almost entirely white, with one or two dark patches only on the longer feathers. Wing 17·75 inches; tail 6·6; tarsus 2·7; middle toe and claw 2·45; bill to gape 3·1, height at gonys 0·68.

In the third year probably the adult plumage would be acquired.

Distribution.—This species, which is the largest of the Black-headed Gulls, is, so far as has been observed, only an occasional cool-weather visitant to the shores of Ceylon; but it is not improbable that stray individuals wander yearly thus far south. Layard met with two specimens at Pt. Pedro, after a severe storm, on the 11th November, 1851; but Mr. Holdsworth does not seem to have noticed it during his sojourn in the north of the island. I saw a single bird at Galle during the cool season of 1870–71; and in November 1874 a young bird was shot at Mount Lavinia by Surgeon Keith, whilst at the same time a pair were killed near Jaffna by Mr. Clarke, of the Forest Conservancy Department, one of these being the specimen alluded to above. On the 13th of March, 1876, a flock of five flew over my canoe whilst crossing the south bar of the Manaar channel; and in November of that year I observed a young bird flying past the Galle Buck at Colombo; and a few days afterwards I saw several more on the Colombo roads. It is evident, therefore, that not a few birds frequent the west coast of Ceylon during the season of migration; and are most likely all immature examples, which, as a rule, wander further south than adults.

Although it frequents the east coast of the Indian peninsula up to the latitude of the Hooghly, which it ascends, according to Jerdon, it is not found at any of the islands of the Bay; nor did Mr. Hume meet with it at the Laccadives, though it is not uncommon higher up the west coast than the latitude of these islands. Jerdon observed it at Madras, and Blyth records it from Chaibassa. Mr. Hume states that it is common in the cool season up the Bhurumpooter to Assam, on the Ganges as high as Monghnjr, and on the Indus to Sukker, and that in October and March they may be seen on all the great rivers of Northern India almost to the foot of the hills, going probably from and to their breeding-places. On the Muncher Lake in Sindh he found it abundant, and also met it at the Sambhur Lake; he likewise constantly met with it at Kurrachee and along the Sindh and Mekran coasts, as well as at Muscat. The central habitat of this species lies, apparently, between the coasts of Sindh and the Caspian Sea, including an area of territory stretching to the south-east and consisting of Egypt and Nubia, where it is far from uncommon, frequenting both the shores of the Red Sea and the interior of the country as high up the Nile as El Kab, being also found on the Fayoom (*Shelley*). From this its regular domain it strays westward to the Greek archipelago, Hungary, and Switzerland, and has once occurred in Great Britain, in June 1859, when it was shot by a fisherman off Exmouth. It is reported to have been obtained at Yeddo by Commodore Perry's expedition; but Mr. Saunders is of opinion that the birds in question, which were immature, may have been the Herring-Gull; to which I may add that it is not recorded by Messrs. Blakiston and Pryer from Japan. In Palestine it is common in spring on the Sea of Galilee, where Canon Tristram met with it in March, and observed that it disappeared then from the country to breed. It is very abundant in the breeding-season on the Caspian and the Volga, whence many specimens are sent to England.

Habits.—This fine bird has been rightly called by many authors a "magnificent Sea-Gull." The purity of its plumage, its conspicuous black hood, its splendid eye, and its stately flight combine to place it in the foremost ranks of the Laridæ. It is in Asia what the splendid Pacific Gull is in the Australian seas, except that the latter, though slightly smaller, is a still nobler bird in its bearing and flight. The Great Black-headed Gull makes its appearance on the coast of Ceylon after or during storms, probably frequenting in fine weather the upper part of the Bay of Manaar, together with the still water in Palk's Straits, whence it is driven towards land by the heavy north and north-west winds which occasionally blow at the latter end of the year. At such times it is to be seen making its way along the coast just outside the breakers with measured strokes of its ample wings, and generally flying rather high. In the winter season it is a very silent bird; but in the

breeding-time it has, according to Pallas, a hoarse Raven-like call like *kori, kori*, which it constantly utters on the wing. Canon Tristram, who speaks of it as a "royal Sca-Gull," writes that on the Sea of Galilee, where it is abundant in March, it used to pass and repass up and down its short length, "making the circuit of the lake close to the edge, and always within shot, as though to keep himself in exercise." In Sindh, where numbers of these birds frequent the Muneher Lake, Mr. Hume noticed that they passed much of their time resting on the water. It feeds upon fish, upon which it plunges, and, according to Von Heuglin, upon garbage (flesh and bones) thrown out from ships, also upon locusts, crabs, and occasionally on reptiles, birds, and small mammals—partaking, therefore, of the voracious nature of all large Gulls.

Nidification.—The great breeding-haunts of this Gull are the shores of the Caspian Sea, the delta of the Volga, and certain lakes in the surrounding region. It is said to breed in colonies, its favourite locality being the islands along the east coast of the Caspian. Its eggs are laid on the bare sand, and are usually two in number, the time of their incubation being in June. In a fine series, in the possession of Mr. Howard Saunders, from the Volga and Caspian, which I have examined, the ground-colour varies from a pale stone-grey to stone, intermediate types having an olivaceous or a brownish hue. They vary in shape from a rounded oval, somewhat stumpy at the large end, to a lengthened pointed oval; one specimen is very broad and short; the markings consist of large blotches and clouds of blackish sepia, in one specimen collected chiefly at the large end, in others they are smaller and more evenly distributed over the whole surface; beneath these darker markings are rather large blotches and small spots of bluish grey in some, and purplish grey in others. In size they vary from 3.25 by 2.14 inches to 2.97 by 2.02 and 2.84 by 2.13.

LARUS BRUNNEICEPHALUS.

(THE BROWN-HOODED GULL.)

Larus brunneicephalus, Jerdon, Madr. Journ. 1840, xii. p. 225; Butler & Hume, Str. Feath. 1876, pp. 31, 32; Saunders, P. Z. S. 1878, p. 197; Hume, Str. Feath. 1878, p. 491 (B. of Tenass.), et 1879, p. 115 (List B. of Ind).

Larus brunneicephalus, Jerdon, Blyth, Cat. B. Mus. A. S. B. p. 289 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270.

Xema brunneicephalus (Jerdon), Kelaart, Prodrum, Cat. p. 137 (1832).

Xema brunneicephala, Jerdon, B. of Ind. iii. p. 832 (1864); Holdsw. P. Z. S. 1872, p. 480; Hume, Lahore to Yarkand, p. 300, pl. 32 (1873); Scully, Str. Feath. 1876, p. 203.

Xema brunneicephalum (Jerd.), Legge, Ibis, 1874, p. 32.

Ghoriki, Turki (Scully); *Kadal Kuruvi*, Sea-bird, also *Pullu*, Wormpicker.

Adult male and female (Ceylon). Length 16·5 to 17·7 inches; wing 12·5 to 13·9, reaching 1·50 beyond tail; tail 5·0 to 5·6; tarsus 1·9 to 2·1; middle toe and nail 1·8 to 1·9; bill to gape 2·2 to 2·4.

Iris white, in some, however, with traces of the immature "brown;" bill coral-red, brownish at the tips and the margins adjacent dusky; eyelid red; inside of mouth bright red; legs and feet coral-red, the webs brownish red, claws blackish.

Winter plumage. Head, upper part of hind neck, upper tail-coverts, tail, and entire lower plumage white; occiput and nape with the tips of the feathers dusky in places; a brown spot in front of the eye and one at the tips of the ear-coverts; back and wings very pale blue-grey, palest on the back, and fading gradually on the lower hind neck into the white of the upper portion; terminal part of the first 6 or 7 primaries black; their bases white, gradually increasing towards the innermost, almost the whole of the outer web of the 1st being black; a white spot near the tips of the first two, and sometimes one at the extremity of the 6th or 7th; primary-coverts and winglet white, with usually a black edging or mark on the longer of the winglet-feathers. In perfect adults there is frequently a small grey spot or mark on many of the tail-feathers, where the inner edge of the immature band would come. The streaks on the nape are variable in extent, but the occiput is scarcely ever pure white, there being nearly always a dusky mark where the brown edge of the dark hood comes in summer.

Summer plumage. Entire head and upper throat dark brown, intensifying at the lower edge of the hood, which encircles the neck just below the termination of the auricular winter spot; rest of plumage as in winter. This dress is acquired as early as the beginning of March in Ceylon, when I have observed specimens with perfect dark hoods at Jaffna; some examples are to be seen in November with partially dark heads.

Young. The nestling of this Gull has not, so far as I am aware, been described.

Immature, 1st winter (Ceylon). Wing 12·0 to 13·0 inches.

Iris hazel-brown at first, afterwards mottled with white in the second year; bill yellowish red, blackish at the tips; legs and feet fleshy yellow or reddish yellow, the joints and webs dusky.

(December.) Head and face whitish, mingled with brown; tips of the hind neck and back-feathers brown; scapulars, wing-coverts, and tertials brown, with fulvous-grey edgings; winglet, primaries, and secondaries blackish brown, the white portions of the base of the primaries much as in the adult, but less on the inner webs; the white spot on the first two primaries wanting; tips of the winglet-feathers, shorter primaries, and the secondaries white; outer webs of primary-coverts black, except at the tip; a broad black-brown subterminal band across the tail; under wing-coverts brownish at the tips.

I have been unable to procure an example in younger plumage than the above, which is the dress worn by young birds on their arrival in Ceylon. The adult plumage with the tail pure white is not acquired until the 3rd year; the next stage to the above is with the back and scapulars French grey as in the adult, the lesser and median wing-coverts brown, with slaty edges, the greater series blue-grey, like the scapulars. The tail-band is the last imma-

ture character to disappear, traces of it remaining in the form of spots on some of the feathers, the remainder being pure white.

Obs. Examples from the Irrawaddy delta are recorded by Dr. Armstrong as measuring:—Length 17·0 to 18·2 inches; wing 12·4 to 13·0, expanse 38·75 to 44·25; tail 4·8 to 5·2; tarsus 1·75 to 2·0; bill from gape 2·15 to 2·25. I notice here the beautiful *L. gelastes*, Licht., the Slender-billed Gull, which is an inhabitant of the region lying between the Mediterranean and the north-west coast of India, and which might perhaps, at some future time, occur in Ceylon. It is remarkable for the delicate pink coloration of the upper tail-coverts, neck, and under surface, is a little smaller than the subject of the present article—wing (♂) 11·7 to 12·2, (♀) 10·8 to 11·0, bill from gape 2·4 to 2·6—and has the bill blackish red and the legs and feet deep red; the mantle and wings are delicate French grey, and the 1st primary all white, except the tip and the outer web, and the next three with a successively broader tip and a dark band on the inner web.

Distribution.—This handsome Gull, which is a winter visitor to Ceylon, is very abundant in the north of the island and for a considerable distance down the east and west coasts, beyond which it strays south in limited numbers. It appears about Trincomalee during the month of October, and in November is very numerous, collecting in large flocks, chiefly composed of young birds, in the bays near the fort, when the annual sea-fishing at that season is being carried on. From this time until March they are not uncommon about the salt lakes and on the open shore between Trincomalee and Jaffna. They are found in small numbers along the east coast to Batticaloa, and probably extend to the Hambantota district, but I have not noticed them there. At Galle an occasional straggler is seen generally from January until March. In December and March I have seen it about Colombo roads, at the latter date always on its way north. Higher up, on the west coast, it is found in numbers in Kalpitiya Bay and about Karativoe Island, north of which it is

Subfam. STERCORARIINÆ.

Bill with the base covered by a cere, hooked at the tip, rather stout and short; nostrils placed in front of the cere. Wings long and pointed. Tail moderate. Legs longer than in the *Larinæ*. Claws hooked.

Genus STERCORARIUS.

Bill covered for two thirds of its length by a smooth cere, flattened somewhat at the base; nostrils narrow and oblique, opening in front of and beneath the cere; tip hooked, but not elevated; gonys short and straight. Wing with the 1st quill much longer than the 2nd. Tail with the centre feathers exceeding the rest; of 12 feathers. Tarsus much longer than the middle toe, covered in front with stout scales; feet fully webbed; claws hooked; hind toe very small.

STERCORARIUS ANTARCTICUS.

(THE ANTARCTIC SKUA.)

Lestris antarcticus, Less. *Traité d'Orn.* p. 616 (1831).

Lestris catarrhactes (Linn.), Hutton, *Ibis*, 1865, p. 277.

Stercorarius antarcticus (Less.), Gray, *Gen. B.* iii. p. 653 (1845); Buller, *B. of New Zeal.* p. 267 (1873); Saunders, *P. Z. S.* 1876, p. 321.

Cape Hen of sailors, also *Sea-Hen* (Layard).

Adult (Campbell Island, Brit. Mus.). Wing 17·0 inches; tail 6·5; tarsus 3·2; middle toe (without claw) 3·0; bill to gape 2·5, height at base 1·0. "Length 24·0" (*Macgillivray* fide *Layard*).

Iris dark brown; bill brownish black; legs and feet black.

(Campbell Island.) General colour glossy wood-brown, dark on the head and paler on the neck and under surface,

common, frequenting the flats beyond the Manaar channel and the coast thence on to Jaffna in numbers. In March 1876 I saw many birds with dark hoods in the latter neighbourhood; and these doubtless were on the point of leaving for their breeding-grounds.

It is a very abundant bird on the coasts of India, and in the northern parts ascends the large rivers, such as the Ganges, Brahmapootra, Indus, &c., far into the interior, likewise affceting fresh- and salt-water lakes widely removed from the sea. At the Sambhur Lake, "the water of which," writes Mr. Hume, "is often nearly saturated brine, and where it is difficult to guess what they find to eat, Brown-headed Gulls are seen throughout the cold season in vast numbers." On the Sindh coast it is not common, though it is found more or less plentifully throughout most of the surrounding north-western region at one locality, in which (the Kunkrowlee Lake in Rajpootana) Mr. Hume observed it in numbers in the cold season. It does not appear to extend westwards up the Gulf of Oman, being there replaced by the Sooty Gull; but in the breeding-season moves to the north-east, through Kashmir towards Thibet, for Dr. Henderson found it abundantly in July near the Pangong Lake, where it was breeding near a stream in the Chagra valley; north of this region still, Dr. Seully observed it in November and December at Kashgar, and again in January near Sughlak, which proves that it does not altogether forsake its breeding-haunts in the winter. Turning eastward, to complete my notice of its range in India, it is stated to be common on the Hooghly, in Furrcepdore, and throughout the region at the head of the Bay of Bengal, swarming at the mouth of the Rangoon river (*Armstrong*), not uncommon in the winter on the Sittang (*Oates*), and also along the coast of Tenasserim, and inland up the creeks as far south as Tonka (*Hume*). From this region it migrates northwards into Mongolia, where Prjevalsky met with it on Lake Dalai-nor during its migration north from the middle of March to the middle of April; on other lakes it was scarce. He states that they breed plentifully on the lakes of the Hoang-ho valley, and that the earliest migrants appeared at Koko-nor on the 5th of March. Père David likewise met with it frequently in Mongolia and also in China. It has been obtained in Persia; but Swinhoe

and passing into dark sepia-brown on the back, scapulars, and wing-coverts; neck-feathers with fine light-brown shaft-streaks; the scapulars with brownish-grey central spots at the tips; the edges of the wing-coverts slightly paler than the centre of the feathers; primaries black towards the tips, and white thence to the base; the outer web of the 1st quill wholly black; secondaries white at the base; tail black-brown, primary and tail-feather shafts white; tail beneath pale at the base.

Young: nestling. "Dark brown, mottled with white." (*Hutton*.)

Immature bird. (Campbell Island.) Wing 16.5 inches; tail 6.5; tarsus 3.0; middle toe (without claw) 2.5; bill to gape (straight) 2.5, height at base 0.88.

(Ceylon.) Pale brown throughout, the neck-feathers with light shafts and greyish tips; the under-surface feathers tipped with greyish; wing-coverts with the central portions near the tip fulvous, becoming paler at the extremities of the feathers.

Obs. Mr. H. Saunders finds that the largest birds are from the Southern Ocean, between the Cape of Good Hope and New Zealand, and that those from the South Atlantic have a tendency to a pale frill of acuminate feathers.

A likely bird, perhaps, to occur in Ceylon is the Skua inhabiting the Mekran coast, and which Mr. Hume has named *S. asiaticus* (*Stray Feath.* 1873, p. 269), considering it to be different from Richardson's Skua. The specimen which constitutes the type measures:—Length 19.0 inches; wing 13.0; tail 6.4, central feathers 0.75 longer than the adjacent pair; bill at front (including cere) 1.2, from gape 2.02. Iris brown; legs and feet dull black; bill brown; cere pale greenish brown; chin, throat, and breast white, the flanks barred with brown.

Distribution.—A fine immature example of this Skua was brought to me at Colombo, in October 1875, by a native, who stated that it had been caught by another man near Maravilla, on the Negombo and Chilaw canal. The bird's wing was cut; it was very tame, and it had the appearance of having been accustomed to the society of man, although the native asserted that it had been caught only a few weeks. I am unwilling, in the face of this not wholly reliable evidence,

does not seem to have noticed it on the China coasts. Northward of the Mongolian territory it does not seem to extend, for it is not recorded from Siberia; and though Cassin noticed it as having been obtained in Japan by Parry's expedition, Mr. Saunders is of opinion that the example in question was nothing but *L. ridibundus*.

Habits.—The Brown-headed Gull, which takes the place in Ceylon of the Kittiwake and the Laughing Gulls of European coasts, associates in large flocks, and when thus assembled together in certain localities, to feed on the shoals of sardines which throng the sea on the north coasts, is quite as much an ornament to tropical waters as those well-known birds are to English seas. They follow shoals of these fish for days, and collect in hundreds at fishing-time, hovering over the buoys of the sein-nets, some alighting on the water and seizing the fish which jump over the line, others plunging down on their prey from above, while many spend their time in fruitless endeavours to snatch the food from the much swifter-flying Terns. They evince no fear whatever of the scantily-armed fishermen, dropping into the water within an oar's length of their canoes, or joining

to take it for granted that it was captured in a wild state so far out of the known range of the species; and I therefore place it as a doubtful member of the avifauna of Ceylon. At the same time, by so doing, I by no means wish to infer that it may not, in like manner with the Cape Pigeon, have strayed north into the Gulf of Manaar; I adopt the present course simply because I am unable to prove that it was not brought to the island in a ship from southern seas.

The habitat of this large Skua is the southern seas, from the edge of the pack-ice northward to the Cape of Good Hope and the shores of Australia. Between these parallels it is found in the vicinity of the existing islands, but does not occur from New Zealand eastward to Cape Horn, where, again, it is found at the Straits of Magellan and the Falkland Islands. Its most northerly *ordinary* limit in the Pacific appears to be Norfolk Island, but it has occurred as far north as Rockingham Bay. It was procured by the naturalists of H.M.S. 'Challenger' at Tristan d'Aencha, Kerguelen Island, and the Falkland Islands. Captain Hutton states that it is very numerous on Kerguelen Island and Prince Edward's Island, breeding there, and that it is very rare north of lat. 45° S. At the Cape, Layard observed it in April; but it does not seem to be common there. Gould likewise records it from the Cape of Good Hope and near Cape Horn, and remarks that he saw it nowhere so abundant as off the coasts of Tasmania, near Storm Bay. I have seen it frequently off the west coast of Australia, and in the Bight between King George's Sound and Bass's Straits. The occurrence of one specimen only on the coasts of New Zealand is noticed by Mr. Buller.

Habits.—The Skuas (or Parasitic Gulls, as they are sometimes called) subsist largely on the food taken by Gulls, Terns, and Petrels, which they chase until they drop their booty. The Antarctic Skua, which is one of the largest of its family, is a bird of bold, fierce disposition and powerful flight, often wandering far from land in company with the Petrels which affect the Southern Ocean, and associating with them, in order to rob them of the food which they pick up in the wake of vessels. I have seen it steadily cruising round a flock of "Cape Pigeons," watching for an opportunity to launch itself after these assiduous toilers of the sea: catching sight of one which has picked something up, a few vigorous strokes of its pinions give it the required impetus, and it descends with a rush upon the pretty bird, turning and twisting after it with almost motionless pinions. Dr. M'Cormack, of H.M.S. 'Erebus,' speaks of a fierce Skua (evidently this species) which haunted the breeding-place of the Albatross at the Auckland Isles, ever on the watch to pounce down and devour this bird's egg on her quitting it in search of food. It is said to prey on the flesh of other birds at Kerguelen Land, avoiding the water. The individual alluded to above was kept by me in confinement for six months, and then brought home to the Zoological Gardens, where it was unfortunately allowed to fly away. I confined it in an aviary containing a Ceylon Wood-Owl and a Malay Bittern (*Gorsachius melanolophus*); it proved to be, as might have been expected, a most ravenous bird, gobbling up the Owl's meat whenever it dropped from the perch above, or chasing the Bittern round the aviary and snatching its food from its bill, and this after it had been amply fed itself. It had a hoarse cackling cry, which it chiefly gave vent to when hungry.

Nidification.—This Skua, which has been found breeding on the Crozets, Kerguelen Land, and Prince Edward's Island, lays, according to Captain Hutton, on low flats, among moss and grass two or three feet high, making no nest. The eggs are two or three in number, and are described by Layard, from specimens brought from the Crozets, as "pale brown-green, spotted, chiefly at the obtuse end, with large and distinct pale purple and brown blotches;" they measure 3.0 by 2.08 (2" 1") inches. An egg from the Chatham Islands is described by Capt. Hutton as olive-brown, with large brown and purplish-grey spots; length 3.1 by 2.1 inches.

four or five together in chasing a Tern, which, hotly pursued, almost dashes against the boats as it darts through the thick of its enemies and swallows its prey in its flight. I have not noticed this Gull dive as the Kittiwake does when plunging into a shoal of sprats; but it spreads out its legs, and half alighting on the water as it reaches the surface, bobs its head under and seizes the fish. When tired of circling round, flying up and down, and hovering over the shoals of fish, they settle in flocks of a dozen or more on the water, floating lightly on its surface close together, some every now and then rising and starting off on a new cruise, while others espying the flock from a distance, come and join it. They repose a good deal on rocks, two or three sitting together; and their mode of progression on the sea-beach is by short little runs, which they take with considerable grace of deportment. This Gull, like others of the smaller species, is noisy when in company, and constantly utters its note *krāh-krāh*, particularly when chasing its companions for the fish they have been fortunate enough to catch.

Nidification.—Although this species has been ascertained to breed near the Pangong Lake in Thibet and in the valley of the Hoang-ho, no account of its nesting-habits, or description of its eggs and nest, have as yet been published. Whether Prjevalsky took the eggs or not I do not know; but Dr. Henderson did not succeed in finding the nest at the Pangong Lake.

G A V I Æ.

Fam. PROCELLARIIDÆ.

Bill hooked at the tip, which is elevated and distinct from the base in both mandibles; sides grooved, in some furnished with lamellæ; nostrils tubular, placed on the base of the culmen and opening to the front. Wings long and pointed. Tail short, variable in the number of feathers. Legs short, placed far back; the tibia more feathered than in the last family. Feet fully webbed, the outer toe not shorter than the middle; hind toe present as a claw only.

Of oceanic habit and powerful flight. Of variable size. Nesting on rocks or in holes in the ground. Sternum with one fissure in each half of the posterior margin.

Genus PUFFINUS.

Bill rather long and slender, the tip much elevated and hooked, the gonys curved; nostril-tube flattened above, rather short, and with two orifices with a division equal to their width. Wings long, the 1st quill slightly exceeding the 2nd. Tail of 12 feathers, graduated, rounded at the tip. Tarsus much compressed, the sides protected by well-defined scutes, shorter than the outer and middle toes; hind claw very small.

PUFFINUS CHLORORHYNCHUS.

(THE GREEN-BILLED SHEARWATER.)

Puffinus chlororhynchus, Lesson, *Traité d'Orn.* p. 613 (1831); Newton, *Ibis*, 1861, p. 181, et 1867, p. 359.

Puffinus, sp.?, Legge, *Str. Feath.* 1875, p. 374; Hume, *ibid.* 1879, p. 115 (List B. of Ind.).

Adult male (Ceylon). Length, from skin, 15·5 inches; wing 10·6; tail 5·2; tarsus 1·8; middle toe 2·0; outer toe 2·0; bill to gape (straight) 2·0; length of nostril-tube 0·3.

Iris dusky; bill dusky greenish; legs and feet fleshy white.

Above glossy smoke-brown; the wing-coverts and tertials slightly darker than the back, the latter with a greyish tinge or bloom (similar to the appearance of a Tern's wing) on the centre of the feathers; primaries and tail brownish black; beneath uniform pale brown; the chin and gorge pervaded with ashy grey; under tail-coverts dark brown, the tips slightly paler than the rest of the feathers; under wing uniform grey-brown.

Obs. An example of this Petrel in the British Museum from Bourbon is a facsimile of the specimen here described; the only difference perceptible is the slightly less grey tint of the under surface. It measures:—Wing 10·8 inches; tail 5·0; tarsus 1·8; middle toe and claw 2·25; bill to gape (straight) 2·0, length of nostril-tube 0·35.

This species is very close to *P. fuliginosus*, which is larger, has a longer bill and white under wing-coverts; wing 11·5 to 11·7 inches, tarsus 2·1, bill to gape 2·2.

A species of this group inhabiting the Persian Gulf, and larger than the Dusky Shearwater, *P. obscurus*, Gm., has been described by Mr. Hume as *P. persicus* (*Str. Feath.* 1873, p. 5). It measures—length 13·0 inches, wing about 8·0, bill at front 1·2. "Bill pale lavender, dusky at the tip; iris dark brown; legs white, with an opalescent gloss; lower part of tarsus blackish" (*Butler*). Upper plumage blackish brown, paler on the head; the underparts white, with the flanks, axillaries, and a portion of the under wing-coverts and the longer under tail-coverts deep brown; the white of the face encircles the eye, extending backwards from the posterior angle as a narrow streak for 0·4 inch (*Hume*).

Distribution.—This species, which is one of the most interesting of late additions to the avifauna of Ceylon, occurred for the first time on the west coast in May 1875. During the height of the S.W. monsoon two individuals were met with on the Bolgodde Lake not far from Panadura. They were on the water near the mouth of the lake, and one was shot, the other escaping. The specimen procured was sent to Mr. MacVicar, who gave it to me. In January 1875 I saw two Petrels, evidently of the same species, swimming in the sea near the fort of Trincomalee; and recently Mr. MacVicar writes to me that the Colombo Museum has acquired a specimen shot last year on the west coast. The Green-billed Petrel would therefore appear to be a not unfrequent straggler as far north as Ceylon. It is an inhabitant of the southern part of the Indian Ocean, and is not at all uncommon at the Mauritius, Bourbon, Rodriguez, and other islands. Mr. Edward Newton met with it at Rodriguez in October; and the Shearwater of the Seychelles, which he met with between the islands of Praslin and Mahé, is identified by him doubtfully as this species. Specimens were evidently not procured, and hence the doubtful identification; but it is probable, I think, that the birds seen were Green-billed Shearwaters. I have seen dark Petrels near the Cocos Islands, and thence southwards to the vicinity of the west coast of Australia, which I conclude belonged to the present species.

Habits.—Like other members of its family, this Petrel is purely a denizen of the ocean, dwelling on the wide waste of waters hundreds, nay thousands, of miles from land, which it rarely approaches, except for the purpose of rearing its young. All Petrels appear to be perfectly at home in all weathers on the vast ocean expanse; and the present species forms no exception to this rule. Solitary individuals are frequently seen flying across the track of vessels passing through the trade-winds; they come in sight, perhaps, away on the weather-beam, shearing over the billows, one wing up and then down, with great speed; in a few minutes they

will have crossed ahead of the ship or flown round it at a distance, making their way off to leeward, and disappearing as rapidly as they came in sight. Their flight is performed by swaying the body as it were from side to side, with the wings outstretched, and not flapping, but turned up successively from the horizontal, the course after each sudden inclination being downward and then up again with a rapid sweep, overtopping the waves, and instantly dropping again into the succeeding trough of the sea. They feed on marine substances, oily matter, the fat of whales when it can be procured, and any garbage they may find floating on the water. They sit buoyantly on the water, and must of necessity sleep in that position, possibly reposing a good deal by day.

* *Nidification*.—The Green-billed Petrel breeds at Round Island, Mauritius, at Rodriguez, and probably other islands in the Indian Ocean. Mr. Edward Newton, who visited a breeding-place of this species at the first-named island, gives an interesting account of it in the 'Ibis,' 1861, p. 181, stating that there is a large colony at the north-east of the island, although they are spread over the greater part of it. He observes that they are as tame as the Tropic-birds, but not so harmless. "They breed," he says, "under stones, and bite most awfully if they get a chance. The only way to get them out and take their single egg is to contrive to turn them round so that one can grab their folded wings and tail. If dropped on the ground they will run about, and for some time will not try to fly; but if thrown into the air, they will glide down gently towards the sea. On going near any rock where there may be a dozen or two, one bird seems to give the alarm, and a chorus of the most extraordinary sounds immediately proceeds from under ground. I hardly know what to compare it to, as there is nothing like it except, perhaps, the noise made by cats when they set up their backs and squall. . . . It is kept up for a minute or two, and increases when the individuals are hauled out in the manner above described." Two eggs of this Petrel from Round Island, for an examination of which I am indebted to Mr. Footitt, of Croydon, are elongated ovals, one slightly broader than the other, and both a little pointed at one end; they are dull white and smooth in texture, measuring 2·57 by 1·51 and 2·3 by 1·53 inches.

Genus DAPTION.

Bill short, stout, the base rounded, with a groove running out to the tip; sides inflated; nostrils with a single orifice, and divided inside the tube, which is flattened and slightly elevated in front; upper mandible with very shallow oblique lamellæ; gonys straight. Wings long, pointed, the 1st quill the longest; secondaries short. Tail short, of 14 feathers, and rounded at the tip. Tarsus reticulate in front, compressed laterally, and shorter than the middle toe, which is shorter than the outer; hind claw stout and very short.

Under tail-coverts very long.

DAPTION CAPENSIS.

(THE CAPE PETREL.)

Procellaria capensis, Linn. Syst. Nat. i. p. 213 (1766).

Daption capensis (Linn.), Steph. Shaw's Gen. Zool. xiii. p. 241, pl. 28 (1820); Gould, B. of Austr. vii. pl. 53 (1848); Hutton, Ibis, 1865, p. 287; Hume, ibid. 1870, p. 438; Buller, B. of New Zeal. p. 299 (1873); Hume, Str. Feath. 1879 (List B. of Ind.), p. 116.

Le Pétrel tacheté ou le Damier, Buffon, Pl. Enl. 964; *White-and-Black-spotted Petrel*, Edwards, Glean.; *Cape Pigeon* of sailors; *Pintado Petrel* of some.

Adult male and female (Australian seas). Length, from the skin, about 16·0 inches; wing 9·7 to 10·5; tail 4·0 to 4·3; tarsus 1·6 to 1·7; middle toe 2·0 to 2·1; bill to gape 1·5, height at tip 0·4; length of nostril-tube 0·4. "Weight 14 to 18 oz." (Gould). "Expanse 36·0 inches" (Hutton).

Genus OCEANITES.

Bill slender, vertically compressed, tip much hooked; nostrils placed in a narrow single tube, much recurved at the front. Wings much pointed, the 2nd quill the longest, the 3rd next and considerably longer than the 1st. Tail emarginate, of 12 feathers. Legs moderately long, with a considerable portion of the tibia bare; tarsus smooth, and longer than the outer toe, which exceeds the middle; claws flattened.

Of small size.

OCEANITES OCEANICUS.

(WILSON'S STORM-PETREL.)

Procellaria oceanica, Kuhl, Beitr. Zool. p. 136, tab. x. fig. 1 (1820).

Thalassidroma wilsoni, Bonap. Comp. List, p. 64 (1838).

? *Thalassidroma pelagica* (Linn.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 272.

Thalassidroma —?, Holdsw. P. Z. S. 1872, p. 480; Legge, Str. Feath. 1875, p. 375.

Oceanites oceanicus (Kuhl), Dresser, B. of Eur. pt. 67, 68 (1878).

Mother Cary's Chicken of sailors (applied to all the Storm-Petrels).

Adult female (Mekran coast). "Length 7·12 inches; wing 6·25, expanse 16·37; tail 3·0; tarsus 1·3; bill at front 0·5, from gape 0·7." (Hume.)

Iris brown; bill black; legs and feet shining black, the webs duller, with a yellow patch in the centre.

Dark sooty brown, the wings and tail blackish brown, and the tail darker than the back; secondaries and tertials paler than the primaries; upper tail-coverts and the sides of the lower white; lower flanks white in some.

Obs. This species differs from the common Storm-Petrel, *O. pelagica*, in the length of its legs and the peculiar coloration of its feet. It is slightly larger too. A specimen of the latter in my collection measures—wing 4·6 inches, tarsus 0·9, bill to gape 0·6.

O. melanogaster, Gould, which inhabits the Australian seas, and has been found in the Bay of Bengal, may occur on the coasts of Ceylon, and may, indeed, be the species that has been seen there, instead of the subject of the present article. It measures—wing 6·5 to 6·6 inches, tail 3·0 to 3·45, tarsus 1·65 to 1·7, bill to gape (straight) 0·83. The upper tail-coverts are white, with the feathers of the rump above the white band tipped with white; feathers along the edge of the wing above and beneath whitish; under tail-coverts, vent, and sides of belly and breast

Iris brown; bill black; legs and feet deep brown, the toes spotted at the side with whitish.

Head, face, cheeks, hind neck and its sides brownish black; the upper throat and chin spotted with the same in some, in others with the white of the entire under surface extending almost to the chin; back, scapulars, rump, upper tail-coverts, and tail white, tipped with black, gradually less to the upper tail-coverts; tail with a black terminal band $1\frac{1}{4}$ inch in width; lesser wing-coverts, primary-coverts, terminal portion of the secondaries, outer webs of the primaries, and a considerable part of their inner webs brown-black; greater coverts and rest of the primaries and secondaries white; under tail-coverts tipped with blackish brown; axillaries tipped with black; all the central part of the under wing white, black round the edge.

Captain Hutton observes that this species varies but little in plumage, so that the adult dress must be put on by the time the young birds have spread over the ocean and commenced to follow ships, after the manner of their kind.

Distribution.—This well-known Petrel, the Cape Pigeon of sailors, finds a place as an oceanic species in the list of Ceylon birds owing to the fact of an example having been killed in the Gulf of Manaar between Ceylon and the mainland. Mr. Hume recorded the capture of this bird (which, it would appear, was killed by a Mr. Theobald) some years ago in the 'Ibis.' It is a remarkable instance of a southern oceanic species straying far beyond the limits of its ordinary range; and there is no reason why the Antarctic Skua should not likewise have wandered thus far north. This species is one of the most abundant Petrels in the southern hemisphere, and is familiar to all who have made the voyage round either cape to Australia. It is equally

white, the middle of the breast and belly blackish brown; axillaries and centre of under wing white; bases of the feathers across the throat whitish, showing conspicuously in some. *Immature birds* have the feathers of the back and the scapulars tipped with white, and a conspicuous patch of the same across the throat.

Distribution.—The identification of any bird on the wing, particularly an oceanic species, is at all times very unsatisfactory; and I regret exceedingly that the interesting little visitor in the shape of a Storm-Petrel, which has been frequently seen on the Ceylon coasts, has not been shot, and its identity put beyond all doubt. Layard speaks of it as occasionally flitting about the roads at Colombo and the Galle harbour; and Mr. Holdsworth has seen it at Colombo and on the west coast during stormy weather, remarking in his catalogue that it has seemed to him "entirely black, with the exception of the white rump." On the 19th August 1874 I observed an individual flying about in calm weather in the wake of the colonial steamer 'Serendib' at Batticaloa. I could see no other white marking about it beyond the white upper tail-coverts, which would be the case with Wilson's Storm-Petrel, as the white under tail-coverts could not be seen. As, however, the bird was not nearer to me than 100 yards, and was flying low, I could not have easily distinguished the white sides of the breast and belly had it been *O. melanogaster*, and therefore it is impossible to say with certainty what our species is. In the Mergui archipelago Mr. Davison has seen numbers of Storm-Petrels in July which Mr. Hume considers to belong to this species. Captain Butler met with it and obtained specimens on the Mekran coast and in the Gulf of Oman in May. It is found in the South Atlantic, frequenting Table Bay sometimes; it ranges into the North Atlantic, straying to the west coasts of Europe and the British Isles. In the Australian seas it is abundant, and is seen generally off and on between there and the Cape of Good Hope. On the Australian coasts it is recorded by Mr. Ramsay from Wide Bay, New South Wales, Victoria, South Australia, Tasmania, and Western Australia. It inhabits the New-Zealand seas, and has been found at New Caledonia. It is seen on the eastern coasts of North America, and is not uncommon near the Azores, ranging also southwards to Kerguelen Land.

Habits.—Like all Storm-Petrels, this little bird is an inhabitant of the wide ocean, being seen in company with its congeners about ships, where it picks up plenty of food in the shape of refuse thrown overboard. It often settles on the water, and flies much with its legs down, patting the crests of the waves as it skims over them; and at this time I have noticed that it raises its wings high above its back. Its flight is performed with rapid beating of the wings, and is very speedy. Its tiny form, besides being very apparent against the huge billows, is much dwarfed by contrast with immense Albatrosses, among which it often intrudes when following ships.

I know nothing of the *nidification* of this Petrel; but an egg in the Wolley collection, which Professor Newton informs Mr. Dresser is probably authentic, measures 1.28 by 0.81 inch. The Storm-Petrels breed on the ground among stones, or in sandy burrows or crevices. The eggs are white, or white with small reddish freckles.

numerous in the South Atlantic, South Indian, and South Pacific Oceans, but nowhere more so than off the Australian coasts, appearing on the passage down from Galle in latitude 30° or 32° , and accompanying the ship thence to Bass's Straits. It is common off the coasts of New Zealand, and between there and Tasmania. I have not found it so abundant off the Cape of Good Hope, which, however, I rounded at the end of April, when the bird was mostly absent at its breeding-haunts. Mr. Gould records it as plentiful off the Horn, and remarks that, owing to its habit of following ships, it is led away into warmer latitudes than it usually frequents; he was informed by Lieut. Blackett, R.N., that it will follow vessels from the Cape of Good Hope to St. Helena, and from Cape Horn to Rio Janeiro. I find it mentioned by Mr. Ramsay as having occurred at Cape York probably under similar circumstances; and this being the case, its appearance near the coasts of Ceylon is not difficult to account for. A second instance of its occurrence north of the Line is known to me, namely, when Layard met with it, in November 1866, in lat. 3° N., which is about five degrees lower than the point reached by it in the Gulf of Manaar.

Habits.—Of the many species of Petrel which follow in the wake of ships voyaging in the south seas, greatly assisting by their animated presence to vary the monotony of a long passage, none are more attractive than the Cape Pigeon, whose variegated black-and-white plumage contrasts with the sombreness of many of its smaller companions; while the persevering manner in which it courses backwards and forwards just underneath the stern of the vessel, making turn after turn with almost motionless wings, merely inclining the body towards the perpendicular to enable it to reverse the direction of its flight, cannot fail to rivet the attention of the traveller. In common with all its family it is possessed of extraordinary powers of flight, the most remarkable feature of which is the great amount of impetus or momentum which is imparted to the body by a few vigorous strokes of the wing, enabling the bird to progress for some distance afterwards with no other motion than a quick upturning of the wing-plane to enable it to turn in its course. The progress thus made by the Cape Pigeon is very rapid, for it sweeps backwards and forwards with greater proportional speed than most other species. When any substance is observed on the water, these birds settle down for an instant, sitting lightly on the billows until they rise again, which they do by spreading out their wings and taking one or two vigorous strokes, propelling themselves along the surface, and then mounting in the air. They are caught by means of white worsted let out from the stern of the vessel, which, not seeing, they fly against, and entangling their wings, are hauled on board. Sometimes a piece of wood is attached to the worsted, which falls in the water, and, scudding along after the vessel, keeps down the end of the string. I have tried these means, and know that they fail entirely if the speed of the vessel is not slow. When brought on deck this and other Petrels vomit, out of sheer fright, a strong-smelling oily substance, which in the present bird is said to be of a red colour. They are unable to rise from the deck. "Their cry," writes Captain Hutton, "is like the sound made by drawing a piece of iron across a large-toothed comb—*cac, cac, cac-cac, cac*, the third being pronounced the quickest." I have never heard it utter any note on the wing; and I imagine that, as a rule, it is a very silent bird.

Although so common a species, the breeding-haunts of the Cape Pigeon do not appear yet to have been discovered, as it does not resort to Kerguelen Land, Tristan d'Acunha, or other islands frequented by Albatrosses. Darwin was informed by sailors that it bred on the island of South Georgia; and it is not improbable that it may resort to other portions of land near the Antarctic circle and beyond the limits of ordinary voyages.

Order PYGOPODES.

Bill straight and pointed. Wings short. Tail wanting or rudimentary. Tarsus highly compressed; feet lobed; hind toe elevated.

Plumage silky. Tibia enclosed within the integuments. Young following the parent when hatched.

Genus PODICEPS.

Bill straight, high at the base, pointed, the commissure nearly straight from the gape, which is angulated; gonys short and ascending; nostrils oval, advanced, placed in a lengthened membrane. Wings short, concave, pointed; the 1st and 2nd quills the longest; the inner webs notched. Tail wanting. Tibia feathered nearly to the knee. Tarsus highly compressed, serrated posteriorly, scutellate anteriorly. Feet very large, webbed at the base, the terminal portion of the toes lobed; nails broad and flattened; hind toe lobed.

Neck slender. Under plumage silky. Sternum very short, broad, expanding at the posterior edge, with one rounded notch.

PODICEPS FLUVIATILIS.

(THE LITTLE GREBE.)

Colymbus fluviatilis, Tunstall, Orn. Brit. p. 3 (1771, ex Briss.).

Colymbus minor, Gm. ed. Syst. Nat. i. p. 591 (1788).

Colymbus philippensis, Bonnat. Encyl. Méth. i. p. 58, pl. 46. fig. 3 (1823).

Podiceps gularis, Gould, P. Z. S. 1836, p. 145.

Podiceps philippensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 311 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 822 (1864); Holdsw. P. Z. S. 1872, p. 480; Legge, Ibis, 1875, p. 407; David & Oustalet, Ois. de la Chine, p. 512 (1877).

Podiceps minor, Hume, Nests and Eggs, iii. p. 646 (1875); id. Str. Feath. 1879 (List B. of Ind.), p. 115.

Podiceps fluviatilis (Tunst.), Dresser, B. of Eur. pt. 77-79 (1880).

Le Castagneux; *Le Castagneux des Philippines*, Buff.; *Little Grebe*, Lath.; *Dabchick*, popularly. *Churaka*, *Pandub*, *Pan tirri*, Hind.; *Dubari*, Bengal.; *Chumighak*, lit. "Diver," Turki (Scully); *Mukelepan*, lit. "Diver," Ceylonese Tamils.

Diya-Saaru, Sinhalese.

Adult female (Ceylon). Length 9.2 inches; wing 3.9 to 4.0; tarsus 1.1; middle toe 1.8; hind toe 0.4; bill to gape 1.0, at front 0.75.—*Male* (Furreedpore). Length 8.1 to 9.0 inches; wing 3.75 to 4.0; tarsus 1.25; bill from gape 1.16 to 1.18, at front 0.8 to 0.83; weight 5.5 oz.—*Female*. Length 8.2 inches; wing 3.83; tarsus 1.25; bill from gape 1.12, at front 0.77; weight 5.87 oz.—*Adult*. (India, Brit. Mus.) Wing 3.7; tarsus 1.18; bill at front 0.73. (England) Wing 3.85; tarsus 1.18; bill at front 0.67.—*Male*. (Egypt, Mus. Dresser)

Wing 3·9; tarsus 1·8; outer and middle toe 1·8; bill at front 0·82. (Nepal) Length 9·4 to 9·6; wing 3·9 to 3·95; tarsus 1·3 to 1·4; bill at front 0·7 to 0·78 (*Scully*).

Iris dull golden; bill black, with a white tip, base and round the gape pea-green; legs and feet blackish green; inside of tarsus pale olive-green. In the breeding-season there is a yellow spot at the gape.

Breeding-plumage (Ceylon). Chin, gorge, and front of cheeks blackish brown; head and hind neck black-brown, pervaded on the head with grey; ear-coverts, sides and front of neck glossy chestnut, the feathers slightly tipped with white; back, scapulars, rump, and wing-coverts brown; the interscapular region and scapulars with the feathers tipped with grey; primaries paler brown than the wing-coverts, white at the base; secondaries white, washed with brown at the terminal portion of the outer webs; feathers round the rump brown, their bases tawny yellow; chest and flanks brownish, the feathers tipped with white; middle of the breast white, the bases of the feathers brown at the sides; lower flanks and vent greyish brown, the former with the bases of the feathers yellow, like the rump; under wing white.

Some examples are much whiter than others, and are apparently birds in their second year, as the white under surface is characteristic of youth.

In winter there is no rufous on the neck, but the throat is rufous-buff, extending on to the ear-coverts, and the chin and gorge are whitish.

Young. The chick is covered with dark grey down.

Immature (India, B. Mus.). Chin and throat white; ear-coverts, sides of neck, and head pale rufous, the upper surface paler brown than in adults; the under surface white. "Bill, culmen black, rest light orange; legs greenish ochre, soles black; iris reddish yellow" (*Cripps*). The red of the neck is more or less absent in some specimens.

Obs. Although the Indian, Chinese, and Philippine races of this Dabchick have been separated from the European form by some authors, there appears to be no valid reason for such a determination. The species varies somewhat according to country and climate, but not, so far as I can see, in any constant manner, and accompanied by any corresponding difference in size. European examples are, I think, darker than Indian, particularly on the under surface; there is more black on the chin, and especially more brown on the outer webs of the secondaries, which latter characteristic has given rise to the separation of the eastern form as a white-winged bird; there is perhaps less of the rufous-chestnut on the neck, but the plumage is of the same general character. As will be seen in the synonymy, Tunstall's title has priority over Gmelin's generally adopted name. The race inhabiting the Malay archipelago appears to have a longer bill than the Indian; but I observe that Herr Meyer identifies the Celebean bird as *P. minor*. A Timor specimen in the national collection has the bill at front 0·9 inch.

The Australian Little Grebe, *P. nove-hollandiae*, is united with the present species by Messrs. Schlegel and Dresser; but one or two specimens I have examined do not correspond well enough with the latter for me to consider the two forms identical; so for the present I keep the Australian bird distinct. It has the chin, cheeks, and throat black, the rufous coloration being confined to a broad stripe down the sides of the neck, the fore neck beneath the black being pale brownish, passing into the greyish brown of the chest. Other species not very dissimilar are *P. nestor*, Gould, from Australia, and *P. rufipectus*, Gray, from New Zealand, which have the head and cheeks striped with grey. In the former the head is brown and the throat mouse-grey; in the latter the head is black and the fore neck reddish.

Distribution.—The Dabchick is widely distributed throughout the low country of Ceylon, besides which it has, I am informed, recently found its way up to the Nuwara-Eliya lake, which has an altitude of 6200 feet. It is nowhere seen in larger numbers than on the Colombo Lake, where it is a permanent resident; on some occasions I have seen a flock of more than thirty on the larger sheet of water, and, as a general rule, there are a dozen or more in this locality. It is not uncommon in the tank-districts from Kurungala northwards, and I have met with it in small village tanks near Trincomalee. Its having ascended the highest mountains in the island and discovered the newly constructed lake at Nuwara Eliya is very remarkable, as there is a rise to the plateau, both on its eastern and western side, of more than 2000 feet, both streams flowing down precipitous and forest-clad gorges; but I am credibly informed by several people, and among them by Mr. Thwaites, of Hakgala, who pays particular attention to the birds of the district, that it has been seen there during the cool season.

In India this Grebe is abundant: there is, writes Mr. Hume, scarcely any considerable-sized pond,

tank, or lake on which it may not be seen during the cold weather. It inhabits elevated waters, being found permanently at the lake on the summit of the Palanis, at Ootacamund, and in the valleys of Cashmir. As regards the low country, it is common in the Deccan, in Orissa, Chota Nagpur, and the surrounding region, Lower Bengal, the Doáb, and thence up into Cashmir and the Punjab, as well as through all the province of Sindh and the surrounding country. Eastwards it extends from Nepal through Cachar, Upper Burmah, where it is very common, to Tenasserim, in which province it appears to be sparingly distributed. Beyond this region again it is found in Hainan, China, Formosa, and the Philippines. In the winter it is found on the China coasts, frequenting salt water, whither it is driven from inland waters by the frost. Southward it extends to some of the Malay islands, among which are Celebes, Ternate, and Timor. To the north of China it occurs in Japan, being common in Yezo and other parts. Returning again to Central Asia, we find it recorded by Severtzoff as resident in Eastern Turkestan; and the same is the case, to a limited extent, in the highlands of Kashgharia, where Dr. Scully found it in December about unfrozen pools. It is found in suitable localities in Persia; and Canon Tristram met with it in "amazing numbers" at the Sea of Galilee, and also saw it in winter on the Dead Sea; but in the breeding-season it disperses all over the country. In all the southern and central countries of Europe it is very common, inhabiting also the islands of the Mediterranean. In Great Britain it is an abundant species, and universally distributed in suitable localities northward to the Orkneys and the Hebrides, beyond which it is an occasional visitor to the Faroes. It does not breed in Shetland; but we learn from Mr. Robert Gray's work that its nest has been found in Scotland at an elevation of 2000 feet. In Western Europe it ranges through Belgium and Holland, where a few remain in winter, into Denmark, arriving there, according to Mr. Dresser, in April and leaving in September, and beyond which it extends into Southern Sweden and Norway as far as lat. 62° N., likewise straying rarely to Finland (*Dresser*).

It is found in the Baltic provinces and in Poland, being resident in suitable localities, according to Mr. Dresser, who also remarks that it breeds in the eastern portions of Northern Germany, and inhabits Russia as far north as the Riazan Government and the neighbourhood of Moscow; it is also resident in parts of Southern Germany and Austria, although it is, writes Messrs. Danford and Harvie Brown, not common in Transylvania. In Spain, as also in Italy and Sicily, it is, as a matter of course, a stationary species. In Andalusia, according to Col. Irby, it breeds abundantly in some localities; and in Sardinia it is abundant in winter.

On the continent of Africa it is widely distributed, extending from Morocco on the west and Egypt on the east, down both coasts to Cape Colony, where it is common, according to Layard. It is resident, says Favier, in Morocco, but is nevertheless, to a certain extent, migratory, passing north in April and returning in October and December. In Algeria it is a stationary species, as also in Egypt, where it is common; but does not, according to Captain Shelley, affect the Nile. Von Heuglin met with it on the lagoons of the Delta, and on canals and other inland waters in Nubia and Kordofan, and on the Blue Nile; whilst in Abyssinia he found it resident from an elevation of 5000 to 11,000 feet. Southward on the east coast it has been found at Mozambique and Mombas, and extends to Madagasear, where it is resident. It has also been procured in the Mauritius. It is not uncommon in Cape Colony, and is likewise an inhabitant of Damara Land, Benguela, Gaboon, the Gold Coast, and Senegambia. In Damara Land Mr. Andersson procured it on Lake Ngami and other localities in the interior, among which, at the vleys of the Ondonga country, it breeds in vast numbers.

Habits.—The Little Grebe inhabits ponds, tanks, lakes, canals, and other still waters, associating usually in small flocks of half a dozen to twelve individuals, but occasionally assembling in larger numbers, which form a scattered troop generally divided into little parties, keeping at a slight distance from one another. When undisturbed the Dabchick passes its time diving for food or quietly floating upon the water. When pursued in a boat it is capable of swimming very fast, frequently diving and staying a considerable time under water, sometimes reappearing at a long distance behind, or on either side of, the pursuer. It is a most expert diver, disappearing apparently at the flash of the gun, and is consequently very difficult to hit; but when a flock are fired into some of the members frequently get on the wing and fly along the surface of the water, thus exposing themselves to the more effectual aim of the shooter. On the

Colombo Lake I have seen a large flock fly more than half a mile, and, mounting fully 12 feet in the air, endeavour to clear a small steamer which was crossing their course; this, however, is unusual, as the flight of the Dabchick is generally a mere flapping along the surface of the water. Notwithstanding, however, its unwillingness to take long flights, it must be possessed of considerable power of wing, or it could not find its way to artificial pieces of water such as the Lakes of Ootacamund and Nuwara Eliya. The food of this Grebe consists of vegetable matter, larvæ, water-insects, and occasionally minute mollusks and crustacea. Its note is a clear and not unmusical whistle.

Nidification.—The Little Grebe breeds in the Western Province during the S.W. monsoon rains, and, I apprehend, nests in secluded nooks on the Colombo Lake, although I never succeeded in finding its nest. In India it breeds from August till September in the north and in Cashmir, and in May and June in the Nilghiris. According to Mr. Hume, "the nests are sometimes fixed to the branches of some water-overhanging tree a couple of feet above the water, and are then made of twigs, grass, weeds, and leaves; but generally they are mere masses of weeds and rush, founded on some tuft of water-grass, and little, if at all, above the water level." From my own experience, which is confined to the finding of nests in the marshes of Essex, I should say that they were frequently constructed simply as floating masses. I have found them among reeds secured between the upright stalks, and constructed of flags, reeds, and weeds, about 10 inches in diameter, 6 inches thick, and with a hollow, about 2 inches deep, for the reception of the eggs. The eggs, which varied from 4 to 6, were invariably covered over with wet weeds, which, during the day at any rate, seem to afford sufficient warmth for purposes of incubation, inasmuch as the birds have been ascertained not to resort to their nests at that time. It is evident, however, that but little warmth is required to sustain life in this bird's eggs, as I once kept some for nearly thirty hours, and on proceeding to blow them was astonished to find the young alive and cheeping within them. The eggs are long narrow ovals, equally tapering at both ends; the shell is thick and rough in texture, and when first laid is of a dull white colour, becoming afterwards discoloured to yellowish white; some have slight smudges of brown. They measure from 1.5 to 1.6 in length, and from 0.8 to 1.0 inch in breadth. The interior of the shell is deep green. In India the eggs are said to have a faint bluish-green tinge, and vary from 1.28 to 1.52 in length, and from 0.77 to 1.1 inch in breadth. The young appear to take to the water as soon as they are hatched, as I have found newly broken shells in nests without seeing any signs of young near them. They are said not to be able to dive until a few days old, and are often taken on the back of the parent bird when very young.

Order ANSERES.

Bill broad, flattened and depressed towards the tip, covered with a soft skin; tip terminating in a hard decurved "nail;" upper mandible in all but one genus wider than the under, the edges furnished with lamellæ. Wings pointed. Tail short. Legs in some placed far back; in all but one group short and the tarsus laterally compressed. Tibia not feathered to the knee. Feet webbed; hind toe small, moderately elevated.

Of stout form. Tongue thick and fleshy. Sternum with a single notch in each half of the posterior margin. Nidificating on the ground or in holes in trees. Young autophagous.

Fam. ANATIDÆ.

Bill straight from the gape to the tip, which is suddenly bent down in the form of a pointed nail, of nearly equal width throughout; under mandible shorter than the upper, and fitting inside the lamellate edges of the latter. Wings pointed, furnished with a spur in some. Tail short, varying in the number of feathers. Legs short; tibia feathered nearly to the knee. Tarsus scutellate in front. Feet fully webbed; hind toe in some furnished with a membrane.

Of natatorial habit. Sternum with a deep oval-ended notch in each half of the posterior margin.

Subfam. ANSERINÆ.

Bill high at the base, exceeding its width there; culmen sloping down to the tip, not narrower at the base than at the tip. Legs longer, and placed further forward than in the next subfamily; feathered nearly to the knee in most genera.

Head usually small; neck long in most.

Genus SARCIDIORNIS*.

Bill short; base of the culmen flat, the ridge between the nostrils narrow; nostrils rounded, pervious, placed in a depressed membrane; nail large and prominent; lamellæ in both mandibles wide apart and shallow. Wings pointed, 1st and 2nd quills subequal and longest, furnished with a prominent tubercle beyond the point. Tail of 12 feathers, rather long, rounded. Tarsus shorter than the middle toe, with stout anterior scutes.

Bill in the male with a high stiff comb.

SARCIDIORNIS MELANONOTUS.

(THE INDIAN COMB-GOOSE.)

Anser melanonotus, Forst. Ind. Zool. p. 21, pl. 11 (1781).

Sarcidiornis melanotus (Penn.), Blyth, Cat. B. Mus. A. S. B. p. 302 (1849).

Sarkidiornis melanonotus (Penn.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon,

* I place this bird and the following species among the Geese, as I cannot consider them as belonging to the true Ducks (Anatinæ). In so doing I follow Jerdon, who, however, places the first in a separate subfamily, Plectropterinae ("Spurred Geese"). The Black-backed Geese (*Sarcidiornis*), examples of which may be seen at the Zoological Gardens, are thorough Geese in their structure, deportment, and walk, not possessing the smallest resemblance to the true Ducks.

B. of Ind. iii. p. 785 (1864); Holdsw. P. Z. S. 1872, p. 479; Hume, Nests and Eggs, iii. p. 636 (1875); Legge, Ibis, 1875, p. 407; Butler & Hume, Str. Feath. 1876, p. 27. *Sarkidiornis regia*, Eyton, *apud* Kelaart, Prodrum, Cat. p. 136 (1852). *Sareidiornis melanonotus* (Penn.), Hume, Str. Feath. 1879, p. 114 (List B. of Ind.). *Die schwarzüeckige Gans*, Forster, *l. e.*; *Oye de la côte de Coromandel*, Buff. Pl. Enl. 937; *Black-backed Goose*, Jerdon; *Comb-Duck*, *Spurred Duck*, Sportsmen. *Nukhta*, Hind.; *Sutu ehilluwa*, Telugu; *Mukan-Tara*, Ceylonese Tamils. *Kabalittia*, Sinhalese.

Adult male (India, breeding-season). Wing 15·3 inches; tail 6·0; tarsus 2·7; middle toe 2·7, its claw (straight) 0·5; bill to gape (straight) 2·5, height at base 1·2; height of comb 1·8, length at base 2·0. The comb rises from the forehead, its base extending to within 0·3 inch of the nail; it is very much smaller at other times.

Iris dark brown; bill black; comb black; "legs and feet greenish plumbeous" (Jerdon).

Head, neck, throat, and entire under surface white, shading into cinereous grey on the flanks; the feathers of the forehead tipped with black so deeply as to hide the white bases; those of the crown less so; a black bronzed stripe extending from the nape down the hind neck, but not to the lower edge of the white, and thence towards the sides of the chest; and as far as this extends the feathers on the sides of the neck are spotted with black; back, wings, and tail glossy green-black, highly illumined on the wing-coverts and secondaries, which have a combined metallic coppery lustre as well; primaries slaty black; middle of the back brownish grey, blending into the metallic colour of the rump; tail blackish brown; sides of the rump from the coverts to the thighs brown; axillaries black; under wing brownish black.

Female (Ceylon: Brit. Mus.). Wing 11·5 inches; tail 4·5; tarsus 2·0; middle toe 2·2; bill to gape (straight) 2·0; comb absent.

Similar to the male, but the colours of the upper surface less brilliant, and the back and rump whitish, passing into grey on the upper tail-coverts; the neck blacker than in the male; the brown patch at the sides of the rump not present.

Obs. Von Heuglin unites the South- and North-African form (*S. africana*, Eyton) with the Indian; but other authors hold it to be distinct from *S. melanonotus*. I have not met with any African specimens, and am therefore unable to offer any personal opinion on the subject. The Indian bird is said to be larger than the African; and the director of the Cape-Town Museum, in writing to the Secretary of the Zoological Society on the subject, among other points of difference, notes that the white of the neck encroaches on the back between the shoulders, and that the lower part of the back is dirty whitish grey. A right determination, however, cannot be arrived at until a series of specimens from both localities have been carefully compared; and this, so far as I can ascertain, has not yet been done. The wing-dimension, according to Von Heuglin, of North-east African specimens is 13·0 to 14·0 inches.

The American Black-backed Goose, *S. carunculata*, Licht., differs from the present species in being larger, in having the flanks black, the secondaries more highly bronzed, and the tail longer, the latter point being noticeable on comparing the living specimens of the two species in the Zoological Gardens.

Distribution.—The "Comb-Duck" is more common in Ceylon than is generally supposed by those who have not visited the forest wilds of the island. Though nowhere numerous, it is found here and there in jungle-begirt tanks in the north and east, and no doubt wanders about a good deal, as it is said to do in India, repairing to the most secluded spots to breed, and afterwards affecting some of the larger and wilder sheets of water throughout the forests and near the sea-shore. Layard speaks of it as not uncommon on the tanks of the Vanni; and Mr. Parker writes me that it is tolerably common, but not plentiful, in the North-western Province and in the Anaradhapura district, frequenting the Madewatchiya and other tanks. It is found at Mullaittivu and at Toopoor, south of Trincomalee. In the Batticaloa district it affects the Ambaré, Irukka-man, and other tanks; and Mr. Fisher, C.C.S., met with it near Yāla, and found it breeding there. It likewise affects Tissa-Maha-Rama tank, and is found, I believe, at Urubokka and other tanks near Tangalla. This bird was first described from Ceylon by Forster, who erroneously states that it is common in the hills.

In India it is said to be rare in the south, moderately common during the rainy season, and also in the Deccan (*Davidson*); found in various districts between the Ganges and the Godaveri, where it is recorded from Lohardugga, Sirguja, Sambalpur, Nowagarh, Karial, and Raipur (*Ball*). It is not uncommon in the cold weather about Calcutta, but is migratory to the North-west Provinces, where Mr. Hume states that it breeds. Westward towards Siudh it is plentiful in certain districts, though it has only recently been obtained *in* that province. It is found in Jodhpore and in Oodeypore at the Kunkrowlee lake, where Mr. Hume met with it in flocks; it is also recorded from Cutch and Kattiawar, and occurs occasionally at the Sambhur Lake. Eastward of Calcutta it is not generally common, for though Blyth notices it as such in Burmah, and Captain Wardlaw Ramsay found it breeding at Tonghoo, it has not been met with in Tenasserim, and does not extend into the Malay peninsula.

Should the African species be indisputably united with the present, it will extend the range of the Black-backed Goose from North-east Africa to the Zambesi river and Cape Colony, and thence up the west coast to Senegal and Gambia.

Habits.—This Goose associates in small parties varying from four to a dozen individuals, and chiefly frequents tanks in which there is much overgrowth—grass, weeds, rushes, &c. Mr. Parker informs me that he has generally found it shy; but in India, according to Jerdon, it is not a particularly wary bird. It is sometimes found there in paddy-fields and on very small tanks and water-holes, as is the case in the Eastern Province in Ceylon. Mr. Fisher informs me that the young when frightened take to the jungle, and hide themselves so expeditiously that it is impossible to find them. Its flight is heavy, and when walking it is an ungainly bird, its heavy-looking head and broad tail, combined with its rather awkward gait, lifting its feet high and taking rather long strides, give it any thing but a graceful appearance. Its note, as I have heard it in the Zoological Gardens, is a low guttural quack-like sound, between the voice of a Duck and a Goose. When wounded it is said to dive well. It feeds on grain, grasses, vegetable matter procured in the tanks it frequents, and seeds of water-grasses, a remarkably hard quadrangular variety of which Col. Sykes found in the stomachs of Deccan specimens.

Nidification.—In Ceylon this Goose breeds, I understand, in February and March; but in India, according to Mr. Hume, the breeding-time in the North-west Provinces is in July and August. It makes a nest of "sticks, dead leaves, grass, and feathers, at no great height from the ground, either in some large hole in the trunk of a tree, or in the depression between three or four great arms where the main stem divides, at a height of from 6 to 10 feet." Very rarely it is placed on the ground among reeds and sedge. Mr. A. Anderson, in some interesting notes contributed to the 'Ibis,' 1874, says that the male bird assists the female in the selection of the site; and he has seen them flying into trees together, the male uttering a harsh grating noise. He has also found the nests in holes in old ruined forts. The eggs appear to vary from seven to twelve; but Mr. Anderson states that fifteen to twenty have been brought to him; and on one occasion a female was captured on her nest containing forty eggs: the nest-hole was in a banyan 30 feet above the ground, and was 3 feet deep and 2 in circumference; the eggs were laid several tiers deep; and, judging by the emaciated condition of the bird, did not appear to have been the produce of other individuals. The eggs are regular ovals, only slightly more pointed at one end than the other, delicate ivory-white and very highly polished; they vary from 2.22 to 2.48 by 1.65 to 1.75 inches.

Genus NETTAPUS.

Bill small, very high at the base, narrowing towards the tip; nostrils oval, placed close to the culmen; nail gently curved; lamellæ distant, except at the base, where they narrow and change their direction. Wings lengthened, pointed; 1st quill considerably the longest; tertials lengthened. Tail broad, cuneate, of 12 feathers. Tarsus much shorter than the middle toe. Feet large, claws much curved.

Of diminutive size.

NETTAPUS COROMANDELIANUS.

(THE GREEN-BACKED GOOSE-TEAL.)

Anas coromandeliana, Gmel. ed. Syst. Nat. i. p. 522 (1788).

Anas girra, Lath., *apud* Gray, Ill. Ind. Zool. ii. pl. 68 (1832).

Dendrocygna affinis, Jerdon, Cat. Madr. Journ. 1840, xii. p. 219 (winter dress).

Nettapus coromandelianus (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 302 (1849); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 786 (1864).

Nettopus coromandelianus, Hume, Str. Feath. 1878, p. 486 (B. of Tenass.), et 1879, p. 114 (List of Ind. B.).

Nettapus coromandelicus (Gm.), Hume, Nests and Eggs, iii. p. 638 (1875).

Anserella coromandeliana (Gm.), Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 407.

Coromandel Teal, Lath.; *Sarcelle de la côte de Coromandel*, Buff. Pl. Enl. 949, 950; *Girra Teal*, Gray & Hardw.; *The Cotton-Teal*, *Green-backed Teal*, *Rice-Teal*, Europeans; *Pigmy Goose* of some. *Girja*, *Girri*, Hind.; *Ghangerel*, Bengal.; *Rajah-Tara*, lit. "King-Duck," Ceylonese Tamils.

Mal-Saaru, lit. "Flower-Teal," Sinhalese.

Adult male and female (Ceylon). Length 12·5 to 13·0 inches; wing 6·4 to 6·8; tail 3·0 to 3·2; tarsus 1·0 to 1·1; bill, gape to nail (straight) 1·15 to 1·2.

Iris crimson or red (variable in hue); bill greenish black, pale at base of upper mandible, and yellowish fleshy at base of lower; tibia and exterior of tarsus with the webs brown, inside of tarsus, toes, and part of web adjacent yellowish olive.

Breeding-plumage. Forehead, centre of head, and nape blackish brown, the feathers often pale-tipped; rest of head, neck, breast, and all beneath to the vent white; a black ring, tinged above with green, completely encircling the hind neck and lower fore neck, the feathers above it with the bases brownish, and the flanks stippled openly or "dusted" with brown; back, scapulars, tertials, and wing-coverts dark metallic green, the bases of the back and scapulars glossy purple, this colour predominating in parts, and changing on the rump into a duller greenish and purple tint; secondaries fine metallic green, with the terminal half-inch white; primaries (mostly) and their coverts green-black, the middle part of the longer feathers being white, which extends across and includes the tips of the inner ones; shorter upper tail-coverts brown, paling to greyish on the longer, the whole stippled with small dots; tail brown, with a greenish gloss, and sometimes tipped pale; vent and under tail-coverts brown, the basal half of the feathers white; axillaries and under wing dark green.

Male in winter (November). Differs from male in summer in having the hind neck brownish, and in having a zone of transverse marks or bars across the front and sides of the neck, instead of the dark band; the feathers here are

barred with black, chiefly on the concealed parts; face faintly striated with brown, and a brown stripe from the bill to the eye, continued a little from the posterior edge; upper surface browner than in summer, particularly as regards the scapulars, which have a bronzed lustre, but scarcely any green line; under tail-coverts white.

Female. I have no examples of this sex in my collection, nor have I examined any in England, as the bird is not by any means common in museums. The following is Jerdon's description:—"Duller and more brown, above faintly glossed, the primaries want the white patch, the sides of the rump and upper tail-coverts are pale brown; the top of the head is dusky, and there is a dark stripe through the eyes; the neck is mottled with dusky lines; the underparts are dirty white; the flanks pale brown, and under tail-coverts whitish."

Young covered with black down.

Obs. Examples from Futtehghurh in my collection measure in the wing 6·5 to 6·7 inches; tarsus 0·95; middle toe (without claw) 1·5, bill to gape 1·1. These measurements correspond with those given by Mr. Cripps of Furreedpore specimens, whose weight he records as 9·75 to 10·87 oz. Other members of this interesting genus are *N. pulchellus*, Gould, and *N. albipennis*, Gould, from Australia. The former, which is a beautiful species, differs from our bird in having the head and nape brown, with a large white patch below the ear-coverts; the feathers of the fore neck and its sides are handsomely marked with black lunulations, which extend down the flanks; secondaries white, forming a bar across the wing. Wing of males 6·25 to 7·0 inches.

Distribution.—This pretty little bird is common on the tanks of the northern and eastern parts of the island, breeding in many secluded spots, and moving about considerably during the rainy weather. To the Western Province and south-west of the island it is apparently chiefly a N.E. monsoon migrant, as about Christmas-time it is met with on Kotte and Kæsbawa lakes and other similar sheets of water. On the Bolgodde Lake it is doubtless found throughout the year, and I have received it from Amblangoda in September. I have seen it at nearly all the tanks I have visited in the Eastern Province, and northward from Kurunegala to Trincomalee. In the North-western Province, and in the neighbourhood of Anaradhapura it is particularly plentiful; and at Kanthelai and Minery I have met with large flocks. In wet weather it may be found in flooded lands even near the sea-shore.

The "Cotton-Teal" is found all over the low-lying districts of India, except the Provinces of Sindh, Jodhpur, and the surrounding region, although even in this part it is met with in Kattiawar and Northern Guzerat. In the Deccan it is moderately common at both seasons of the year, is plentiful in all parts of Chota Nagpore, and recorded from many places between the Mahanadi and the Ganges by Mr. Ball. In Furreedpore it is abundant during the rains, breeding there, and some remaining in the cold season. In the neighbourhood of Calcutta it is extraordinarily numerous, as many as 500 having been brought into the market in one morning. In Pegu it is very common; Captain Wardlaw Ramsay procured it at Tonghoo; and in the Province of Tenasserim it is confined to the central portions, while further north it has been observed in the tracts west of the Sittang. It is met with further south in the Malay peninsula, as the Calcutta Museum has been enriched by specimens from that region. It has likewise been found in Java. In the Andamans it is uncommon, having only been procured as yet in the island of South Andaman, and rarely there. Eastward of Burmah it is found in China in small numbers during the summer, and extends thence to the Philippines, where it has been procured in Luzon. Returning to the Indian Empire, we find it breeding in the Jhansi district. Then further west in the dry region of Rajpootana, as has been remarked, it is absent, reappearing again in Kattiawar and Guzerat, in which districts it finds a home on rushy and weedy tanks.

Habits.—The Green-backed Goose-Teal frequents tanks and jheels which are overgrown with weeds, and flanked with reed-beds and sedge-growth, in preference to open water; in such places, where it may be seen in small flocks of six to ten, feeding at some distance apart, it generally affects the deep water at the edge of the weedy tracts, swimming slowly along, and feeding on vegetable matter and larvæ, which it takes from the floating leaves; it is loath to rise when approached, and will permit itself to be approached by a sportsman wading into the water within gunshot. When fired at the flock generally flies round the tank once or twice, and then realights, often among lotus-leaves, as if the birds knew that it was almost impossible to distinguish them in such a position. Occasionally, however, when a bird is wounded, its fellows do not even rise if they

only number one or two, but swim off a little way and remain motionless, while their injured companion sinks below the water with nothing but the bill above the surface, so that it is impossible to find its whereabouts. I have only heard their note in the evening, when they are more restless than usual, and often get on the wing and fly round the tank, uttering a weak cackling note. In the breeding-season it is said to be more noisy; and the late Mr. Anderson remarks that its call has been likened to the words "fix bayonets!" whilst Jerdon says that it resembles that of a Grouse. It flies very swiftly, with quick beating of the wings. This bird is much admired by the Singhalese, who prefix the word *Mal* (flower) to the ordinary name *Saaru* (duck) on account of its beauty. Its flesh is very good eating. According to Blyth it cannot walk well, but shuffles along and squats on the ground.

Nidification.—In the northern parts of Ceylon the Green-backed Teal breeds in the early part of the year. In the Anaradhapura district, as I am informed by Mr. B. Price, of the Public Works Department, the natives take their eggs and hatch them under small hens. The nest is made in holes in the limbs of large trees or even on old buildings, and is occasionally placed on the ground among rushes. Some observers say that there is scarcely any lining in the holes, whilst others have found feathers plucked from the birds' breasts in their nests. Mr. F. B. Blewett, writing to Mr. Hume from Jhansi, says that the "Cotton-Teal" makes a semi-floating nest on the water in that district in July and August, constructing it of lotus-leaves, weeds, grass, &c., piled up several inches above the surface. The number of eggs varies from 8 to 12, or sometimes, according to Jerdon, to 15; they are oval in shape and delicate ivory-white, being very smooth in texture. According to Mr. Hume they vary from 1.54 to 1.75 inch in length, and in breadth from 1.17 to 1.38 inch. Mr. A. Anderson observes that both birds assist in selecting a habitation; he once watched a pair which flew into a tree together, and while the female used to enter the hole the male sat on a bough watching for her exit.

Genus DENDROCYGNA*.

Bill high at base, as in the last genus; ridge between the nostrils narrow; upper mandible of uniform width; nail suddenly bent down; lamellæ prominent and narrow. Wings short, rounded, the 2nd, 3rd, and 4th quills subequal and longest; tertials exceeding the primaries; a small tubercle at the point of the wing. Tarsus stout, shorter than the middle toe; hind toe rather long.

* The "Tree-Ducks" are a peculiar group, placed by some authors among the Anatinae, or true Ducks, and by others in the Tadorninae, which may be considered to be a section of Anserinae. Although their habits are somewhat abnormal, they grade into the Geese through the two preceding genera; and in view of their short, high bill and rather lengthened, forward-placed legs, I prefer to class them with the Geese rather than with the Ducks.

DENDROCYGNA JAVANICA.

(THE INDIAN WHISTLING-TEAL.)

Anas javanica, Horsf. Trans. Linn. Soc. 1821, xiii. p. 199.

Mareca awsuree, Sykes, P. Z. S. 1832, p. 168.

Dendrocygna arcuata (Cuv.), *apud* Blyth, Cat. B. Mus. A. S. B. p. 301 (1849) (in part); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Hume, Nests and Eggs, iii. p. 639.

Dendrocygna awsuree (Sykes), Jerdon, B. of Ind. iii. p. 789 (1865).

Dendrocygna javanica (Horsf.), Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1874, p. 27, et 1875, p. 407; Hume, Str. Feath. 1878, p. 486 (B. of Tenass.), et 1879, p. 114 (List B. of Ind.).

Whistling-Teal, *Tree-Duck* of some. *Silli*, Hind.; *Saral*, Bengal; *Harrili Hans*, East Bengal (Jerdon); *Meliwis batu*, Horsf.; *Chemba-Tara*, Ceylonese Tamils.

Tatta-Saaru, *Saaru*, Sinhalese.

Adult male (Ceylon). Length 16·8 to 17·5 inches; wing 7·8 to 8·0; tail 2·4; tarsus 2·0; middle toe and claw 2·8 to 2·9; bill to gape (straight to tip of nail) 2·0.—*Female*. Length 16·3 to 16·8 inches; wing 7·5.

Iris brown; orbits yellow; bill blackish leaden; legs and feet dark plumbeous.

Forehead, crown, lores, hind neck, and interscapular region wood-brown, gradually changing into the dark slaty of the scapulars, back, tertials, and median wing-coverts; the shafts of the head-feathers spinous, and the lower hind neck and upper back broadly edged with yellowish grey and rufous yellow respectively, the latter continued down on the scapulars; lores, face, sides of head, and the neck dusky whitish, paling into albescence on the gorge, and passing into the fine ruddy chestnut of the whole breast and underparts (specimens when newly moulted have a yellowish gloss on the chest); lesser and succeeding row of wing-coverts maroon-red; quills brownish black; upper tail-coverts ferruginous chestnut; tail umber-brown, edged with buff-yellow; under tail-coverts, sides of lower back, and rump dusky buff-yellowish, the basal portions of the coverts with dark interrupted bars; under wing-coverts glossy black.

Female. Has the underparts less ruddy or paler than the male.

Obs. Examples from various parts of India (including Nepal) and Java correspond with Ceylonese specimens in coloration and dimensions. A Nepal specimen measures in the wing 7·7, a Javan 7·3 inches. Mr. Cripps gives dimensions of males as follows:—wing 7·50 to 8·04 inches, tarsus 1·9 to 1·92, bill from gape 1·8 to 2·06. Nicobar specimens are, according to Mr. Hume, identical with Indian.

D. arcuata, Horsf., is another species of this genus, extending from Java to Australia, and is conspicuous for the coloration of the flank-feathers and the head and neck. The crown and centre of the hind neck are brownish black, and the sides of the neck and face buff-white; the upper tail-coverts are *buff-yellow* at the sides; flank-feathers white, with broad black margins.

D. fulva, Gm., is larger than the last species; flank-feathers and hind neck differently coloured.

The following diagnosis of these three forms of *Dendrocygna* may be useful to local students:—

D. javanica. Head wood-brown; no stripe down hind neck; upper tail-coverts chestnut, black in the middle; breast unspotted: wing 7·2 to 8·0 inches.

Habitat. India, Burmah, Java.

D. arcuata. Head dark brown; dark stripe down hind neck; upper tail-coverts buff at the sides, black in the middle; breast spotted; flanks striped, the feathers buff-white, bordered with black: wing 7·5 to 8·3 inches.

Habitat. Java, Malay archipelago, to North Australia.

D. fulva. Head chestnut-brown; black stripe down hind neck; upper tail-coverts buff, black in the middle; centre of the neck striated; flanks striped, the feathers buff-white, bordered with cinnamon-brown: wing 9·0 inches.

Habitat. India, also Madagascar and parts of South America.

Distribution.—The Whistling-Teal is by far the commonest of the Duck tribe in Ceylon, and in some localities is very numerous at certain seasons of the year. It frequents almost every tank, both large and small, in the northern and eastern forests, being met with sometimes on quite small village ponds. I have not seen it on brackish estuaries or salt lagoons, and believe it to be exclusively a freshwater species. In the west of Ceylon, where the country is devoid of artificial irrigation-waters, it frequents the rivers and paddy-fields in their vicinity; on the Bentota river, the Gindurah ganga, the Nilwella ganga or Matara river, and other estuaries it is to be found, more especially in the latter part of the year, keeping to those parts which flow through a large extent of paddy-land; and on the first-named river excellent Teal-shooting is to be had

Genus TADORNA.

Bill somewhat similar in form to that of *Dendrocygna*; sides not so flattened; lamellæ well developed, descending below the edge of the mandible. Wings with a blunt projection just beyond the flexure. Tail short, rounded, of 14 feathers. Legs moderately long; hind toe slightly lobed.

Of large size and conspicuous coloration.

TADORNA CASARCA.

(THE RUDDY SHELDRAKE.)

Anas casarca, Linu. Syst. Nat. iii. App. p. 224 (1768).

Anas rutila, Pall. Nov. Comm. Petrop. xiv. p. 579 (1770).

Casarca rutila (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 303 (1849); Jerdoun, B. of Ind. iii. p. 791 (1864); Hume, Str. Feath. 1873, p. 260, et 1879, viii. (List B. of Ind.), p. 115; Scully, *ibid.* 1876, p. 198.

Tadorna casarca, Dresser, B. of Eur. pt. 41 & 42 (1875).

The Brahminy Duck in India; *Surkhah, Chakwa, Chakwi*, Hind.; *Chakra-baka*, Sanscrit; *Bapana chilluwa*, Telugu (Jerdon); *Hangghut*, Turki (Scully).

Adult male (India, Spain). Wing 14.0 to 15.2 inches; tail 5.4 to 5.6; tarsus 2.4 to 2.5; middle toe 2.3 to 2.4, claw 0.45; hind toe (without claw) 0.5; bill to gape (straight) 2.0 to 2.2.

Female. (Seville) Wing 12.7 inches; tail 4.8; tarsus 2.1; middle toe 2.1; bill to gape (straight) 1.9. (Yarkand)

"Length 24.0 inches; wing 13.75; tail 5.8; tarsus 2.25; bill from gape 2.0: weight 2 lb. 13.5 oz." (Scully).

Iris deep brown; bill, legs, and feet black.

Male (Seville). Head and neck creamy buff, paling on the forehead and face, and darkening on the lower hind neck into the rather light rufous-tawny of the interscapular region, scapulars, chest, under surface, and flanks; a broad ring of black glossed with purple round the neck; the underlying scapulars brownish, mottled with greyish buff; lower part of back vermiculated with brown; rump and upper tail-coverts deep black; tail and primaries dull black; secondaries blackish brown, the terminal portions of the outer webs dark metallic green; the inner webs whitish, except near the tip; wing-coverts white (in some white, washed with creamy buff); tertials rufous-tawny, paling to whitish at the tips, the inner webs brownish; axillaries and under wing-coverts white.

Some males apparently in adult plumage have no collar; this, in a specimen kept in confinement by Mr. Cripps, was not put on until after the hot season.

Adult female (Seville). Face and sides of head whiter than in the male; top of the head washed with brown; no ring round the neck; back darker than in the male, the lower part being brown, vermiculated with greyish buff; otherwise as in the male.

Nestling in down (Volga). Top of the head, down the hind neck, back, tail, and a band on the primaries light brown, the tips of the down being tawny; forehead, face, all the neck but the aforesaid black band, entire underparts, posterior part of the wings, and a stripe down the sides of the back, commencing behind the wing, sullied white.

in September and October. It is found on Kotte and Kæsbawa lakes occasionally, and large flocks are to be seen at the latter end of the year on the upper or freshwater part of the Bolgodde Lake. At the lower end of the Batticaloa Lake it is also abundant at certain times.

This species is very abundant in parts of India, extending into Burmah, Tenasserim (where it is common), and Malacca, and thence southward to Java, whence it was first procured and described by Horsfield. It is likewise abundant at the Nicobars; but in the Andamans it has only recently been procured. In regard to India, I find that it is plentiful in parts of the Deccan, chiefly about wooded districts in the rains and cold weather (*Davidson*); found throughout Chota Nagpur, and recorded especially in that district from the

Young of the year resemble the female; the scapulars are brownish, mottled with rufescent, and the wing-coverts, more especially the greater series, are tinged and tipped with brownish.

A male (so labelled) from Calcutta, dated December, has no ring round the neck; the wing-coverts show no signs of immaturity; but it is probably a bird of the year.

Distribution.—In accordance with the rule adopted in this work, I place this species in a footnote, specimens never having been actually procured and preserved; but I have little doubt of its occurrence in the island, for an account of which I am indebted to Capt. Wade-Dalton, of the 57th Regiment, who is well acquainted with the bird. He met with a pair in February 1876 in the long lagoon which runs inland from Mullaitivu, and writes to me as follows:—"I saw them sitting at the edge of the water, and stalked and shot at them with an 8-bore belonging to a friend; but, thanks to the bad powder in the cartridges, I failed to bag either." As it is, according to Jerdon, a cold-weather visitant to all parts of India, there is no reason why it should not unfrequently stray down to Ceylon. It is common in the Deccan, and is said to remain there until May, the end of the hot weather (*Davidson*). It is very abundant in Sindh, and breeds on the Upper Indus in May (*Hume*). To the valley of Nepal it is a winter visitor, but leaves in December (*Scully*). It is found in Kashgaria up to an elevation of 16,000 feet, and extends into Mongolia, where it is common and held sacred by the inhabitants (*Prjevalsky*). It is not uncommon in Persia, ranging as far north as lat. 50°, and eastwards to the Baikal region, and thence to Japan. On inland waters in China it is not unfrequent; but it is rare on the coasts. It winters in Palestine, and also breeds there occasionally. In Europe it chiefly inhabits the south (though rare in Italy), breeding in Spain and Southern Russia. It is a straggler to Northern Europe as high up as Sweden (*Nilsson*), and strays still northward into Finland. To Great Britain it is a rare straggler. It inhabits Northern Africa, occurring in Morocco, Algeria, and Egypt, breeding in the latter country; and it is said to extend southwards as far as the Blue Nile.

Habits.—This Sheldrake is met with usually in pairs or small troops of half a dozen or more, but is said in India before migrating to assemble in thousands. It is a very well-known bird in that country, being universally called the "Brahminy Duck." "The Hindoos," writes Jerdon, "have a legend that two lovers for some indiscretion were transformed into Brahminy Ducks, that they are condemned to pass the night apart from one another on opposite banks of the river, and that all night long each in its turn asks its mate if it shall come across; but the question is always met in the negative—'Chakwa, shall I come?' 'No, Chakwi.' 'Chakwi, shall I come?' 'No, Chakwa.'" Its note as heard by me in confinement is a low guttural *kape, kape, kape*, and sometimes *ka, ka, ka, khap*, quickly repeated. It walks well, with the same action as the true Geese, and is said to graze, like these birds, in corn-fields. It has been said by a writer in the 'Indian Sporting Review' to devour carrion in company with Vultures; but Jerdon states that he was constantly on the watch to verify this observation, "but never saw any thing approaching to such a habit."

Nidification.—This handsome bird does not seem to be particular as to the site which it chooses for its nest, so long as it appears to afford it the necessary cover. It nests in hollow trees, hollow logs, clefts of rocks, or caves, in which latter locality Canon Tristram found a nest among those of some Griffon-Vultures; and in Mongolia, where it is never molested, besides resorting to holes and clefts in the ground, it sometimes lays in the "fireplaces of villages deserted by the Mongols," in which, writes Col. Prjevalsky, "the females, whilst hatching, get almost quite black with soot." This author says that though the male does not assist in incubating, as soon as the young are hatched he is most vigilant in watching them. The breeding-time of this species, both in Asia and Europe, is in May and June. The eggs are oval and of a pale cream-colour, not to be distinguished from those of the Common Sheldrake. These latter are ovals, somewhat stumpy at one end, smooth, and rather glossy in texture. Specimens before me measure 2.59 by 1.88 and 2.69 by 1.91 inches.

Rajmehal hills, Manbhum, Lohardugga, Sirguja, Sambalpur, Orissa, Nowagarh, and Karial; abundant near Calcutta, and common in the rainy season near Furreedpore. In the North-west Provinces it also appears to be plentiful during the rains; but at other seasons of the year it is, according to Mr. Hume, not so often seen. He speaks of it breeding in Mynpooree, Cawnpoor, Muttra, Allyghur, and Meerut. Further west it is not very common, being found in certain localities in Guzerat, Cutch, and Kattiawar; and in Sindh and Jodhpoor it is very rare, never having been found at the Sambhur Lake.

As it is abundant in the Nicobars and is also found in Java, it is doubtless an inhabitant of Sumatra.

Habits.—This Whistling-Teal or Trec-Duck is essentially gregarious, rarely associating in flocks of less than a dozen; and when not breeding congregates at times in large numbers. It frequents weedy, rushy tanks, and is partial to those which are surrounded by forest. It is fond of spots which are overgrown with Lotus-leaves, no doubt finding an abundance of aquatic insects in such situations. I have generally found it moderately shy, not permitting a very near approach; but when put on the wing it flies round and round the tank or swamp, often passing within shot, and uttering all the time its sibilant whistle until it realights. Although resorting to trees, on the outspreading branches of which they frequently perch in the breeding-season, they are seldom to be seen in such a position at other times of the year; but I have seen them sitting on the dead horizontal branches of partially submerged trees, and on low rocks standing out from the water in the middle of the tank. They resort in the Western Province to the paddy-fields during harvest-time, and feed on rice, then affording good shooting, as their flight, though performed with quick beatings of the wings, is not swift, and they are easy birds to bring down. Although this species, like other members of its family, is to a certain extent granivorous, it also feeds on insects, many of which I have taken from its stomach mixed with a quantity of gravel. The young are fed on insect-dict, as Capt. G. Marshall speaks of a nest he found swarming with ants and maggots; they are probably taken down to the water from the nest on the backs of their mothers, as is the case with other species.

Nidification.—In the west of Ceylon the Whistling-Teal breeds from June until August; but in the northern forests its eggs have been taken in the early part of the year, after the cessation of the north-east monsoon rains. It sometimes builds on the ground among rushes or tussocks, and even in reeds, the nest half floating in water; but it usually selects a hole in a tree, or the fork of two large trunks, and not unfrequently the old deserted nest of a Crow, Kite, or Heron. Trees close to the water's edge are chosen to facilitate the taking of the young to it; sometimes the nest is lined with grass and feathers, but in other instances there is no lining whatever. The maximum number of eggs appears to be fourteen; sometimes ten and twelve complete a clutch. They are pure white, without the gloss characteristic of the eggs of the last species, although their texture is smooth. They are broad ovals, slightly larger at one end than the other. A specimen before me, taken by Mr. H. Parker in the Uswewa district, measures 1·83 by 1·41 inch.

In India it lays from June until the beginning of September; many interesting notes are furnished in 'Nests and Eggs' from Mr. Hume's correspondents, among which I may cite Captain G. Marshall's assertion of having shot a male of a pair, and finding the female provided with another mate on the following day. Again, Mr. Anderson speaks of a friend taking a clutch of twelve eggs from a nest in a date-palm on the 29th of June, and finding fourteen eggs in the same nest on the 13th of July; so that the female must have laid the first egg of the second batch the day after the removal of the first. Mr. Hume finds that the eggs vary from 1·72 to 2·0 inches in length, and from 1·4 to 1·6 in breadth.

Note.—My correspondent Mr. Parker writes me of a large Goose which he has met with on some of the most secluded tanks in the North-western Province; and Mr. F. Fisher informs me that he has also seen a Goose on the wing flying in flocks along the north-west coast. Mr. Parker describes the bird he has noticed as a dark grey, dark-backed Goose; and I am not aware what the species can be but the Grey-Lag Goose of Europe, which visits the north of India largely, straying in limited numbers towards the south. This Goose (*A. cinereus*) measures about 30 inches in length, wing 17 to 18·5; bill fleshy red, with a pale tip; legs and feet fleshy red. Plumage very similar to that of the Domestic Grey Goose.

ANSERES.

ANATIDÆ.

Subfam. ANATINÆ.

Bill longer than in *Anserinæ*, not so high at the base, where it is narrower than near the tip; both mandibles furnished with lamellæ. Wings pointed; the tertials lengthened. Tail variable in the number of feathers. Legs short, set far back. Feet fully webbed; the hind toe not webbed.

Sexes differing in plumage for the most part; the male assuming the dress of the female in the autumn; with a brilliant wing-band or speculum.

Genus ANAS.

Bill at the gape slightly narrower than near the tip; the nail perpendicular and short; lamellæ well developed; nostrils oval, pervious, placed close to the culmen. Wings with the 1st quill equal to or longer than the 2nd. Tail with the centre feathers variable; of 14 to 16 feathers. Tarsus shorter than the middle toe, covered with transverse scutes in front. Claws straight.

ANAS PÆCILORHYNCHA.

(THE SPOTTED-BILLED DUCK.)

Anas pæcilorhyncha, Forster, Ind. Zool. pl. 13, p. 23 (1781); Gray & Hardw. Ill. Ind. Zool. pl. 67 (1833-34); Blyth, Cat. B. Mus. A. S. B. p. 304 (1849); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 799 (1864); Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 407; Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Mareca pæcilorhyncha, Steph. *apud* Sykes, P. Z. S. 1832, p. 168.

Anas pæcilorhyncha, Gm. *apud* Hume, Nests and Eggs, iii. p. 643 (1875).

The Indian Wild Duck, *Grey Duck* of some. *Garm-pai*, Hind., also *Bata*.

Adult male and female (Futtehghurh). Wing 10·3 to 10·9 inches; tail 4·6 to 5·0; tarsus 1·7 to 1·9; middle toe, without claw, 2·2 to 2·4, claw (straight) 0·3 to 0·4; hind toe 0·5; bill to gape (straight) 2·4 to 2·7, at front to bend of nail 2·0 to 2·4. A presumed male in the Poole collection, from Ceylon, measures:—wing 11·6, bill at front 2·4. Jerdon's data are—length 24·0 to 25·0, wing 12·0. The female is the smaller of the sexes.

Note.—This Duck is peculiar in having the base of the culmen naked on each side of the frontal feathers for some little distance, adding additional height to it at that part.

Male (August, Futtehghurh). Iris reddish brown; bill black, about 0·6 of the tip chrome-yellow, the nail black; base of the culmen yellow; tip of the lower mandible yellow; legs and feet orange-yellow; claws black.

Forehead, upper part of lores, top of head, crown, nape, interscapular region, and upper scapulars sepia-brown, darkening slightly towards the tips of the scapulars, and passing into blackish brown on the rump and glossy black on the upper tail-coverts; tips of the feathers of the head, lower hind neck, upper back, and scapulars pale greyish; wing-coverts paler brown than the scapulars, tinged with slaty at the edges of the feathers, margined with white along the edge of the wing, and the greater series with velvety-black tips, and a subterminal band of white on the outer webs; primaries dark brown, the edges of the 1st pale; outer webs of secondaries metallic green, glossed

with violet, tipped with velvety black, and with narrow white extremities; inner webs brown; outer webs of the elongated tertials dull white on the terminal portions; tail deep brown, with narrow fulvous-grey margins; an indication of a pale stripe from the bill over the eye, at the posterior corner of which is a dark patch; throat, face, and neck dull whitish, the feathers with dark mesial lines, except on the chin and upper throat; chest and under surface buff-white, with sepia-brown centres to the feathers; abdomen brown, with pale edgings; under tail-coverts black; under wing and axillaries pure white.

Female (August, Futtehghurh). Bill reddish black; legs and feet greenish yellow.

Slightly paler on the back, the pale margins of the feathers broader; upper tail-coverts tipped with buff-grey; speculum not so brilliant as in the male; the white subterminal band on the greater coverts broader; the brown centres of the under-surface feathers smaller; the feathers of the abdomen and under tail-coverts edged with greyish white. A second example differs from the male in precisely the same manner; but the under-surface feathers are washed with buff, and there is a brownish-buff terminal band on the innermost greater wing-coverts.

Obs. In this species, as in the Pacific Wild Duck, *A. superciliosus*, there is no change of plumage in the male during autumn, as the dress of both sexes is so nearly alike.

I regret to say that I have no data concerning the plumage of the *nestling* or the *immature* in their first autumn. The former is probably covered with brown down above and yellowish white beneath. Full descriptions will no doubt appear in Mr. Hume's 'Game-Birds of India.'

This Wild Duck is represented in China and Mongolia by a closely-allied form with the same plumage, but with a yellow band across the bill, and which has been named *A. zonorhyncha* by Swinhoe. The beautiful Pink-headed Duck, *A. caryophyllacea*, Linn., has been found as far south as Madras, and might some day migrate to Ceylon as a straggler. The head and neck are very pale pink; plumage chocolate-brown; speculum salmon-colour, and the under wing-coverts pink. "Wing $11\frac{1}{2}$ inches, bill at front $2\frac{1}{4}$; irides fine orange-red" (*Jerdon*).

Distribution.—Although this fine Wild Duck is occasionally seen on the tanks in the north and east of the island, I have never met with it myself. During my stay at Trincomalee I heard of it as occurring at Mullaitivu; and Mr. Varian, of the Public Works Department, has observed it on several occasions on the Topoor tank. Layard speaks of it as being not unfrequently met with on tanks in the Anaradhapura district; but my correspondent Mr. Parker has not observed it there or in the North-west Provinces. I have heard of its being seen at Ambaré and Irukkamam tanks and also in the Yāla district; and further south it is said to have occurred on the Matara river. It is probably only a cold-weather migrant from the south of India, and doubtless occurs on passage in the island of Delft, which is a famous resort of Ducks.

It is spread throughout India, being very common on the plains, and extending into the lower parts of the Himalayas, and likewise into Burmah, being said by Blyth to occur in Tenasserim; but Mr. Davison has never met with it there. In the Indian peninsula it is common in the Deccan, and probably breeds there (*Davidson*), rare in Chota Nagpur, and recorded from Sambalpur, Nowagarh, Karial, Sirguja, and Manbhum. From Julpigoorie also Captain Beavan notes it. About Calcutta it is not very common according to Mr. Hume, and in the Furreedpore district it does not seem to occur. In the North-west Provinces and seemingly throughout the plains of Bengal it is plentiful, and westward ranges as far as Sindh, where it is pretty common, but not so numerous as the Mallard. At the Sambhur Lake it is resident, but most abundant during the rains; in Guzerat it is common, as also in Kutch and Kattiawar.

Habits.—The "Grey Duck," which is one of the finest members of its genus in the world, is entirely a freshwater species, frequenting tanks in wooded districts, marshes, and reedy streams, and when spread over the country in the non-breeding time is now and then found on small pools and sheets of water. It is not very gregarious, going about usually in pairs or in small flocks of less than a dozen; it is much sought after in India, owing to its size and the excellent quality of its flesh, and it affords good and easy shooting, being rather slow on the wing. Like most true Ducks, it feeds on grain, seeds, and vegetable matter procured in water, and is said to swallow gravel and small stones, which assist it in digesting its food. It is very difficult, writes Captain Butler, to procure when wounded, as it dives freely, and seldom shows more than its bill above water; it also appears to have the faculty of remaining under water a long time, as the same writer speaks of a "flapper" which was caught, after diving a considerable distance, while taking "refuge in a thick mass of weeds at the bottom of the tank, 3 feet deep, from which moist retreat he was extracted by one of the beaters, who

accidentally trod on him when walking through the water in search of one of the others!" I have, however, seen "flappers" of the Common Wild Duck remain a very long time under water. The call of this species is said to be like that of the Mallard, but not often repeated.

Nidification.—The breeding-season of the Spotted-billed Duck in India is in July and August. It usually constructs a nest of grass and rushes, lined with down and feathers, placed on the ground among rushes, long grass, reeds, or sedge. Mr. Hume, however, speaks of a nest which was placed on the drooping branch of a tree, which hung down into a thick clump of rushes in a jheel. It was about 9 inches above the water, and was firmly based on a horizontal trifurcation of the bough. Fine grass was mingled in this case with the down and feathers, which, as usual, must have been plucked by the bird from its body. The number of eggs does not appear to exceed seven; they are described as broad ovals, smooth in texture, and white or greyish white in colour. They vary in length, says Mr. Hume, from 2·08 to 2·3 inches, and in breadth from 1·65 to 1·8.

ANAS ACUTA.

(THE PINTAIL.)

Anas acuta, Linn. Syst. Nat. i. p. 202 (1766); Naum. Naturgesch. der Vög. Deutschl. xi. p. 638 (1842).

Dafila acuta (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 304 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 803 (1864); Holdsw. P. Z. S. 1872, p. 479; Dresser, B. of Eur. pt. 19 (1873); Heuglin, Orn. N.Ost-Afr. ii. p. 1311 (1873); Schl. & Salv. P. Z. S. 1876, p. 391; David & Oustalet, Ois. de la Chine, p. 498 (1877); Hume, Str. Feath. 1879, p. 115 (List Ind. B.).

Pintailed Duck, Lath.; *Rabijunco*, Port.; *Pijlstaart*, Dutch. *Dig hans*, Bengal.; *Kokarali*, Sindh (Jerdon); *Bulbul*, Arabic (Heuglin).

Adult male (England and Siberia). Length 23·0 to 25·0 inches; wing 10·6 to 11·5; tail 6·0 to 6·5, the central feathers 2·0 to 2·3 longer than the adjacent pair; tarsus 1·5; middle toe 1·5, nail 0·43; hind toe 0·4; bill to gape (straight) 2·5, at front 2·0.—(Ceylon). Two examples: wing 10·2–10·7 inches. The central tail-feathers are attenuated, running gradually to a sharp point.

Iris orange-reddish; bill black, pale blue about the nostrils; legs and feet greyish black.

Male after the autumn moult (Yenesay, 10th June). Head and throat down to the middle of the fore neck earthy brown, the centres of the feathers dark brown, overspreading them on the centre of the head and nape, and changing on the hind neck into a black patch, passing again into the whitish of the lower hind neck, interscapulars, sides of chest, and flanks, all of which parts are very closely cross-pencilled with brownish black; at the side of the nape a white stripe passes down between the black hind neck and the brown of the throat, and spreads over the entire under surface to the vent, the belly being finely stippled with brownish; back greyish white, more closely cross-pencilled with black than the interscapulars; upper tail-coverts whitish with brown centres, the larger lateral feathers with the outer webs black; tail-feathers pale brown with whitish edges, the elongated central pair entirely black; scapulars and tertials elongated and lanceolate, the former black, with broad clearly-defined white margins, the upper or shorter feathers white, cross-rayed with blackish like the interscapulars; tertials greyish white, with broad clearly-defined black centres, some of the feathers mottled with greyish along the outer edges; wing-coverts greyish slate, with a greenish tinge, the greater series broadly tipped with salmon-colour, forming a band across the wing; secondaries brown, with broad white tips sharply defined on the outer webs against a deep black band, changing higher up the feather into coppery bronze, which is deep green in some lights, forming a brilliant speculum in the closed wing; primaries pale brown, the first quill with a whitish shaft, the remainder sullied whitish; under tail-coverts dull black, the lateral feathers with an outer white edge; axillaries whitish, with dark shaft-lines; under wing-coverts brownish grey, stippled with whitish.

The ground-colour of the tertials is brown in some specimens, and that of the upper tail-coverts brownish grey; these are probably not fully adult. The older the bird, the longer the scapular and central tail-feathers are.

This plumage is worn through the winter until about the latter half of the following June, when, after the pairing-time is over, the male undergoes during the month of July a complete moult, and assumes a plumage something like that of the female, with the exception of the wing-coverts, primaries, and secondaries, which are renewed as before. The dress in a male (Archangel, July 31) in Mr. Dresser's collection is as follows:—

Summer plumage. Sides of the head, throat, and upper part of neck fulvous grey, the feathers centred with brown, except on the throat; top of the head blackish brown, the feathers edged with tawny, and paling on the back of the neck into greyish brown; lower part of the fore neck and its sides, together with the under surface, sullied whitish, each feather with a brown bar near the tip, except on the breast, where the bars are reduced into small spots; flanks boldly barred with brown; lower hind neck, scapulars, and back dark brown, the feathers crossed with narrow bars of white, as also stippled with the same; upper tail-coverts brown, crossed with crescentic bars of white; tertials brownish grey, with broad mesial blackish stripes blending into the ground-colour; tail brown,

the feathers with narrow pale margins, the central pair pointed and not $\frac{1}{2}$ an inch longer than the adjacent. In this specimen the primaries are only half-grown, although the rest of the plumage is perfect.

Obs. This dress is proved, by keeping the birds in confinement, to be worn until the end of September, when another equally rapid moult takes place, and by the end of November the full winter and spring plumage has been put on. The wing-coverts, primaries, secondaries, and tail-feathers, with the exception of the two centre pairs, are not moulted; but the scapulars, tertials, and above-mentioned tail-feathers are, while the remaining tail-feathers would seem to become paler and assume white edges. Naumann, who was a very accurate observer, states that only the centre pair of tail-feathers are moulted; but I find that the adjacent pair, which are much pointed and exceed the rest in the handsome dress, are not so in the summer specimen above described.

Adult female. (Petchora, Hakodadi, Wisconsin) Wing 9.5 to 10.0 inches; tail 4.5 to 4.8; tarsus 1.5 to 1.7; middle toe 1.5 to 1.8, claw 0.9; bill to gape 2.2 to 2.3. (Yarkand) "Length 21.75; wing 10, expanse 28.25; tail 4.8; tarsus 1.5; bill from gape 2.35: weight 1 lb. 8.5 oz." (*Scully*.)

"Bill blacker than in the male; iris in very old birds brownish yellow." (*Naumann*.)

"Bill black above, slate-colour below. Iris dark muddy brown; legs and feet slaty green; webs dusky, claws black." (*Scully*, March.)

(Petchora, 24th July.) Face, throat, and neck whitish buff, with dark shaft-stripes; head and down the hind neck dark brown, the feathers edged with tawny on the head, and greyish on the hind neck; lower hind neck, scapulars, back, and upper tail-coverts brownish black, the feathers with margins and crescentic and angular bars of white: the markings of the scapulars, which are blacker than the back, consist of longitudinal streaks of white, tinged with buff; wings brown, the covert-feathers narrowly margined with greyish white, the greater coverts with sharply-defined tips of pure white; the secondaries with broad white tips, surmounted by a black edge on the outer webs of the feathers; tail blackish brown, crossed with wavy angular bars, and marked with longitudinal streaks of white tinged with buff; beneath whitish, the centres of the feathers brown and concealed in parts: flanks brown, with crescentic marks and margins of white; under tail-coverts whitish, streaked with black; axillaries white, with central streaks of dark brown.

The Hakodadi specimen is not so dark above, and the white markings are not so broad.

Young in down (Petchora river). Above very dark brown; blackish on the head, narrowing at the base of the bill into a stripe between whitish eye-stripes; lores dark brown, continued as a dark stripe behind the eye, beneath which there is another whitish streak; a broad whitish band down the sides of the back, and another crossing the wing; beneath whitish, with a dark streak along the face, and the chest tinged with fulvous; bill blackish, the nail yellowish.

Young males, according to Naumann, assume the mature winter dress in the *first year* a month later than old birds; and *young females*, according to the same authority, put on the adult plumage about the same time, and can be distinguished up to the following spring by their darker bill. A female (March) from Wisconsin, America, has the markings of the scapulars and upper tail-coverts and tail rufescent buff, which is apparently the result of immaturity.

Distribution.—This beautiful Duck visits the north of Ceylon during the months of November till March, but is said not to be so numerous as the Garganey or Common Teal. There are specimens of Layard's collecting in the Poole collection, and he states that it used to be occasionally shot on the Jaffna estuary by native duck-shooters. It occurs plentifully every season in Delft, and on the large lagoons at Palverainkadoo and Manaar, and has been met with by Mr. G. Simpson, of the Indian Telegraph Department, and Mr. G. Temple, C.C.S., in the Mullaittivu district.

Though perhaps not so widely spread as some of its allies in India, the Pintail is nevertheless very abundant in the cold season, arriving, according to Captain Butler, in the Guzerat district as early as the 12th October, and leaving again about the 10th April. It is common in Cutch, Kattiawar, and Sindh, as well as in Guzerat, being found more on lakes and jheels than rivers. It is found commonly in Cashmere on the lakes of that State, and also in Oudh and Kumaon, and is very common in the Nepal valley, according to

Dr. Seully; it is likewise plentiful in Lower Bengal, according to Blyth. Southwards in the Deccan it has been observed, but not in any numbers. In Chota Nagpur it is found on the larger rivers, and is abundant at Manbhum; in the adjacent country it is recorded from Lohardugga, Sambalpur, and Raipur. In Furreedpore it is found in large flocks; further east in Cachar it is rare, as also in Burmah, having been only met with in the Engmah swamp, while further south it is merely a straggler, having been procured but once near Moulmein. Beyond Indian limits it is very common on passage, in Mongolia, being abundant in the Hoang-ho valley and also at Lake Hanka at the end of Mareh, passing northwards and but few remaining to breed. In China it is plentiful on passage twice a year, passing the winter in the central and southern provinces, as also in Formosa. In Japan it is common in winter in Tokio, and passes Hakodadi in spring and autumn (*Blakiston*). It is found throughout Eastern Siberia from the Amoor northwards to the Boganida, where Middendorff found it breeding; on the Amoor it is not so common as other species. Westwards, on the Yenesay, Mr. Seebohm found it one of the commonest of Ducks. In Kashgharia Dr. Seully observed it occasionally in Mareh, and ascertained that it bred at Maralbashi. Further north Dr. Finch found it on the Marakul lake near the Ala-taw mountains; it occurs on passage in the east and north-west of Turkestan, and possibly breeds in the south-west (*Severtzoff*). In Palestine Canon Tristram found it on the brook Kedron; and in the Sinaitic peninsula Mr. C. Wyatt met with it, as also Mr. Danford in Asia Minor, between January and April.

As regards its European distribution, my space permits me merely to say that it is found (in some places commonly) throughout the south from Greece and Turkey to Portugal in winter, occurring likewise in Malta and Sardinia; further north in Central Europe, including Austria and Southern Germany, it is mostly a bird of passage, some few only remaining to breed. It is a winter bird in France, and one of passage chiefly in Holland and Belgium; but it breeds in Denmark, as also in North Germany and Central Russia. Northwards it ranges to Archangel in Russia and to Finland; while in Scandinavia it breeds beyond the Arctic circle. On the Petchora Mr. Seebohm found it very abundant, and procured large numbers of its eggs. It is found, in winter, throughout Great Britain and Ireland, but chiefly on the east coast of the former, as far north as the Shetlands; and it is supposed by Mr. Hancock to have bred at Prestwick Car, in Northumberland. It likewise visits Iceland in the summer. Turning south again, we have it found in winter in Africa as far south as Senegal on the west coast, and the Kordofan swamps and Blue Nile on the east, wintering in numbers on the Delta of the Nile, according to Von Heuglin. In America it has a wide range on the coast, extending from North Greenland southwards as far as the isthmus of Panama, being also found in the interior of the United States and on the Saskatchewan. Messrs. Selater and Salvin record it from Cuba and Jamaica; and in Florida it is occasionally very abundant on passage. On the west coast it has been procured in Vancouver's Island; and Mr. Dresser states that it is found in the interior of the continent of North America.

Habits.—This species, which is one of the handsomest Ducks frequenting the Palearctic region, is mostly a freshwater bird, associating in large flocks in the cold weather on open and extensive sheets of water; but in the breeding-season it is found sometimes about the sea-coast in shallow bays. As observed in Europe it is said to be very wary and shy, even more so than the Mallard; but I find that Mr. Hume noticed that in Sindh it had a habit of sitting in parties amongst low water-plants, with nothing but its long white neck showing, and when basking thus it would often admit of a tolerably near approach. It flies with great speed, and is said to be hard to bring down; its graceful form imparts to it an elegant appearance when in the water, and it is said to swim high, with its neck curved like a Swan's. Its note is not harsh, like that of most Ducks, and is not so often uttered, the bird being of rather a silent nature. Montagu writes that its notes are "extremely soft and inward; the courting-note is always attended with a jerk of the head; the other greatly resembles that of a very young kitten. In the spring the male indicates his softer passions by suddenly raising the body upright in the water, and bringing his bill close to his breast, uttering at the same time a soft note. This gesticulation is frequently followed by a singular jerk of the hinder part of the body, which in turn is thrown up above the water." The food of the Pintail consists of vegetable and insect matter, as the roots of water-plants, grain, seeds, &c. are partaken of, as well as insects, larvæ, &c. Its flesh is considered to be excellent eating.

Nidification.—The Pintail breeds in May and June; in the latter month Mr. Seebohm took its eggs on

the Yenesei river in Siberia and on the Petchora in Russia, whilst in America it is said to commence laying about the 20th of May. The nest, writes Mr. Dresser, is made on the ground, often under the shelter of a bush, usually not far from the water, and is lined with small flags or grass-bents; and, within these, down and feathers form a soft bed for the eggs to lie upon. In number the eggs vary from seven to nine. They are smooth in texture, fairly glossy, and pointed ovals in shape, but some are of the same form at both ends. They are pale clear olivaceous greenish. Several specimens in a fine series before me, taken on the Petchora by Mr. Seebohm, measure 2.1 by 1.5, 2.05 by 1.53, 2.08 by 1.51, 2.08 by 1.49 inches respectively.

The "nest-down" is large and hair-brown in colour, not very dark, with rather wide pale centres and just perceptible pale tips*.

* The down with which each species of Duck lines its nest, and to which I apply the term *nest-down*, is an important characteristic in determining the egg, as a thorough acquaintance with it enables the oologist to identify the eggs when the bird is not seen.

ANAS CIRCIA.

(THE GARGANEY TEAL*.)

Anas circia, Linn. Syst. Nat. i. p. 204 (1766).

Querquedula circia (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 305 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 807 (1864); Sharpe & Dresser, B. of Eur. pt. 5 (1871); Holdsw. P. Z. S. 1872, p. 479; Salvadori, Uccelli di Borneo, p. 361 (1874); David & Oust. Ois. de la Chine, p. 502 (1877); Hume, Str. Feath. 1879, p. 115 (List of Ind. B.).

La Sarcelle d'été, Buff. pl. 946; *Marreco*, Portuguese; *The Blue-winged Teal*; *Summer Teal* in England. *Karak aurdak*, lit. "Patch-work Duck," Turki (Scully).

Adult male and female. (Ceylon) Wing 7·1 to 7·7 inches. (Denmark) Wing 7·2 to 7·5; tail 2·5 to 2·9; tarsus 1·1 to 1·2; middle toe 1·4 to 1·5, claw (straight) 0·36; bill to gape 1·8, at front to bend of nail 1·4 to 1·6.—*Female* (Amoy). Wing 6·8; bill at front 1·4.—*Female* (Sambhur Lake). Length 15·0; wing 7·4, expanse 25·5; tail 2·8; tarsus 1·15; bill at front 1·5. "Weight 12·75 oz. to 14·78 oz." (Scully, Yarkand).

The bill in this species has the culmen almost straight, the anterior part not being so much depressed as in the larger species of the genus.

Iris pale brown; bill black, the base beneath pale; legs and feet brown; webs darker.

Male after autumn moult (Leadenhall Market). Forehead, top of head, and nape blackish brown, bounded on each side by a broad white band commencing in front of the eye, and the forehead marked with fine whitish lines; face and neck brownish chestnut, passing on the chest and breast into light tawny, the aforementioned parts striated closely with white, and the latter closely barred with blackish, taking on the chest a crescentic form; the chin black and unmarked, and the lores darker than the face; lower hind neck, interscapulars, and back blackish brown, the feathers with pale margins; the upper tail-coverts marked with zigzag cross bars of white; the scapulars lanceolate, the uppermost feathers black, tinged with green, with parallel-edged white central stripes; the outer and broader concolorous with the wing-coverts, which are pale grey-blue; the greater series with deep white tips, forming a band across the wing; the secondaries with similar tips, the outer webs above them shining emerald-green, and the inner blackish brown; primaries brown, with white shafts and outer margins, the latter vanishing on the two first quills; tertials dark brown, with white outer margins; tail dark brown; abdomen finely vermiculated with brown, spotted with the same on the under tail-coverts, and the flank-feathers crossed with closely set, wavy pencillings of black; the lowermost feathers tipped with blue-grey, above which is a broad white bar edged with black; axillaries pure white; under wing pale brown, darkening at the anterior part, and with a white patch across the centre.

Some examples have the wing-coverts and secondaries less brightly coloured, these probably being younger birds than the above; the underparts vary in the amount of vermiculations.

This dress is worn from October until June, when a rapid moult takes place, and the male assumes a garb very similar to that of the female, except that the wing-coverts and speculum (as, in fact, the entire wing) are as before. The plumage is, however, darker above than that of the female, and the chest is more rufous. In October, or as late as December even, the clothing-feathers are moulted, and the handsome winter and spring dress again assumed. So rapid is the moult in each case that the birds are incapacitated from flying.

Female (Sambhur Lake, August). Head, lower hind neck, back, rump, and scapulars dark brown, the feathers everywhere pale-tipped; tawny grey on the head and hind neck, slaty grey on the interscapular region, rump, and

* The Teals, which are placed under the genus *Querquedula*, Stephens, by most authors, are merely small Ducks, scarcely differing at all from restricted *Anas*, although the bills are not so wide at the tip nor so flattened at that part. The type of the group is the Garganey, which has the bill high at the base, with the culmen almost straight, and, in fact, the whole organ differing almost as much from that of the Common Teal as it does from that of the Mallard; the bill is therefore not a good distinguishing character, and I prefer not to adopt the genus in the present instance.

upper tail-coverts, and whitish with broad outer margins of the same on the tertials; tail dark brown, with whitish margins; wing-coverts faded bluish grey, the greater series with brownish slaty, with the tips for half an inch white; speculum much duller than in the male, with a black bar between the green and the white tips; primary-coverts and inner primaries bluish grey at the outer margins; tertials tinged with green; cheeks, ear-coverts, and sides and front of neck whitish with distinct dark centres, having a mottled appearance; a light stripe over the eyes, and a dark light-tipped band through the lores and behind the eye; chin and upper throat unmarked white; lower fore neck tinged with ochre-yellowish; the centres of the feathers dark, enclosing a light spot; beneath whitish, the centres of the feathers brownish; under tail-coverts patched with brown; flanks brown, pale-edged; axillaries and under wing as in the male.

“Bill black, under mandible brown; legs and feet greyish slate.” (*Scully*.)

Young in down (Jutland). Glossy black above; face above the eye and the throat yellowish, with a broad stripe behind the eye, and another from the lores along the face to the ear-coverts; a faint crescentic pale streak across the back and a spot on each side of the rump; beneath whitish brown across the throat and brownish on the abdomen.

The first plumage, according to Naumann, resembles that of the female; the bill is darker, and the breast more rufescent, and the throat purer white, the male being distinguished from the female by the lighter blue-grey of the wing-coverts. The birds are then about the size of the Common Teal. Bill and feet paler than in the adult. The adult plumage is assumed in October and November.

Obs. Varieties of this species occur sometimes. Jerdon speaks of procuring birds with the whole head, neck, and underparts ferruginous; and in Europe, as also in England, pale yellowish and cream-coloured birds have been shot.

Distribution.—This fine Teal is a winter visitor to Ceylon, being found in the extreme north about the Jaffna peninsula, on the swamps of the island of Delft, and on the west coast down to Manaar during the cool season from November till March. Layard speaks of its occurring in “vast flocks” at the head of the Jaffna estuary; but I do not think it is so common now-a-days; and as early as the month of March it seems to take its departure, as I saw nothing of it in the Jaffna district at that time. Mr. H. E. Hayes, of the Ceylon P. W. Department, shot a pair at Mullaitivu in 1877; and some seasons it extends down the east coast to the Hambantota district, where Capt. Wade-Dalton recently met with it in one or two localities.

The Garganey is very abundant all over India, being found in greater numbers in Bengal than the Common Teal. It is also very common in the peninsular portion of the empire, and notably so in the Deccan. In Chota Nagpur Mr. Ball considers it to be less common than the Teal; but he records it from Manbhum, Lohardugga, Sambalpur, Orissa, Nowagarh, and Karial. It is, according to Mr. Hume, ten times more abundant in the Calcutta market than the last-named bird; and in Furreedpore it swarms in all the small jheels, remaining on the Ganges in the daytime and spreading over the country at night (*Cripps*). It is common in Rajpootana, Guzerat, Cutch, Kattiawar, and Sindh in the cold weather, but not so plentiful as the Teal in some places. In the Guzerat district it arrives, says Capt. Butler, about the 7th September, and remains until about the 14th of April; but a single bird was shot near Deesa on the 7th of July, and I have myself a specimen killed by Mr. Adam at Sambhur on the 26th of August. It is common in the Punjab, in Oudh, and Kumaon; and in Nepal, writes Dr. Scully, it is met with throughout the whole winter. It is found in Burmah and also in Tenasserim in tracts between the Salween and the Sittang, as also to the west of the latter river. It ranges southwards into the Malay archipelago, being found in Java and Borneo, as also in Celebes, where Dr. Meyer says it is rather rare, notwithstanding that it occurs there in summer, as he notes a specimen as procured in Limbotto in July. Turning north we find it recorded from Formosa by Swinhoe, who says that it probably breeds in South China. It has not been observed in North China, although it occurs in Japan. As regards Central Asia, it is common in South-east Mongolia, breeding in the marshes of the Hoang-ho valley. At Lake Hanka it appears as late as the beginning of May, and is ten times as scarce as the Common Teal (*Prjevalsky*). It is found in summer near Yarkand, and breeds in the eastern parts of Turkestan, according to Severtzoff. It ranges into Southern Siberia, and has been found on the Amoor river. Passing westward, I do not find it recorded from Palestine; but Mr. Danford informs me that he met with it in Asia Minor during the latter half of the winter.

In Southern Europe it is a common species, breeding in Greece, Turkey, Italy, and Spain at Perpignan. It likewise breeds in Sicily; is found in Malta in spring and autumn, and occasionally in summer; occurs in Sardinia in spring; appears in Savoy in March and April, a few remaining to nest; and is a summer visitant to Germany, France, and Belgium. It is plentiful at the same season in Denmark, and not uncommon in South Sweden, extending north as a straggler, but not above lat. 60° about. It has been procured near Christiania, according to Mr. Collett. It is sparingly distributed throughout England in the summer, breeding still in some localities in Norfolk; it is rare in the western parts of the country, and is very seldom seen in Wales; it is likewise rare in Scotland, and in Ireland only occurs as a straggler. Turning south, again, we find that in Northern Africa it is distributed from west to east. Favier states that it appears irregularly near Tangier in February and March on its migration to the north, returning in September. Mr. Salvin met with it in the Atlas district; and in Algeria it is common. In Egypt it is moderately abundant and resident, according to Captain Shelley; but Von Heuglin says it is chiefly a winter visitant, extending south to lat. 10° N., spreading along Abyssinian mountain-streams, and frequenting probably the entire coast of the Red Sea. It has been noticed on the west coast of Africa, but not in the south of the continent.

Habits.—This handsome bird has much the same mode of life as its ally, the equally if not better known Common Teal—principally frequenting fresh water, but sometimes in winter resorting to shallow coasts, where the tide reeds and leaves an oozy foreshore abounding in food. It is chiefly a nocturnal feeder, subsisting on grain, seeds, roots, water-plants, worms, small frogs, larvæ, &c., and feeds occasionally, it is said, on small fishes; it resorts to shallow water in marshes, particularly where the bottom is muddy, and during the day hides among reeds and rushes, or in grass at the margins of flooded marshes. Like other Ducks they wander about a good deal at night, alighting on small ponds or pools to feed, and perhaps remaining in quiet spots of this sort, if there is sufficient cover, throughout the day. They fly very swiftly, and are said, when migrating with other Ducks, not to mingle with them, but to proceed only in company with their own species. Great numbers are caught in India, and fed in “Tealeries” for the market, their flesh being excellent. In the north of Ceylon Layard writes that they used to be shot by native hunters using their plough-buffaloes trained for the purpose: guided by a couple of ropes, the shooter walking on the side away from the wild-fowl, and pulling either rope, as occasion requires, to keep himself on the offside, the buffaloes are brought within shot of the birds, and the man then rests his gun on the animal’s shoulder and fires. The Garganey is not a shy bird when not molested frequently; its ordinary note is a harsh *knāk*, from which its German name *Knäk-Ente* is derived; in the breeding-season the Drake is described as uttering a loud harsh call.

Nidification.—The “Summer Teal” breeds in April and May, both in Central Asia and in Europe. It is said to have nested within Indian limits, as Col. Tiekell speaks of having a just-fledged young one brought to him near Moulmein. As it is a species which breeds in comparatively warm regions, there is no reason why it should not occasionally do so in India. The nest is placed on the ground in marshes, meadows, and boggy places near water, amongst sedges and rushes; it is made of flags, rushes, reeds, &c., and is, as usual, lined with down plucked from the bird’s breast. The eggs of the Garganey somewhat resemble those of the common species, but are larger and have a slightly greenish tinge. They may be described as obscure or dull white, tinged very faintly with olivaceous, but which is not perceptible in some; others are faintly tinged with brown. A fine series before me, consisting of two perfect clutches taken in Holland, are almost perfect ovals, slightly stumpy at the obtuse end, smooth in texture, and moderately glossy. Some examples of one clutch measure 1·82 by 1·27, 1·78 by 1·26, 1·79 by 1·26 inch; and three specimens of the other clutch measure 1·8 by 1·37, 1·78 by 1·32, 1·77 by 1·5. In the latter some eggs are rather stumpy at the small end.

The “nest-down” is *pale* brown, with white centres and just perceptible white tips.

ANAS CRECCA.
(THE COMMON TEAL.)

Anas crecca, Linn. Syst. Nat. i. p. 204 (1766).

Querquedula crecca (L.), Blyth, Cat. B. Mus. A. S. B. p. 305 (1849); Kelaart, Prodrum, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 806 (1864); Sharpe & Dresser, B. of Eur. pt. 1 (1871); Holdsw. P. Z. S. 1872, p. 479; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1322 (1873); David & Oust. Ois. de la Chine, p. 502 (1877); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Petite Sarcelle, Buffon, Pl. Enl. 947; *Krückente*, German; *Marreco*, Portuguese. *Tulsia bigri*, Bengal.; *Kerkedj*, Arabic.

Adult male and female. (Sambhur Lake) Length 14.0 to 14.8 inches; wing 6.9 to 7.3, expanse 21.9 to 23.5; tail 2.8 to 3.0; tarsus 1.1 to 1.15; middle toe (without claw) 1.4, claw (straight) 0.3; bill to gape 1.6 to 1.7. (Kashghar) "Length 14.0 to 14.3; wing 7.0 to 7.25; tarsus 1.17 to 1.2" (*Scully*).—*Males* (Europe). Wing 6.9 to 7.3; tarsus 1.1 to 1.15; bill at front to bend of nail 1.4 to 1.5. Bill stouter in the male than in the female; the latter smaller also in all its dimensions.

Male. Iris brown; bill black; legs and feet brown; claws black.

Male after autumn moult (Sambhur, December). Head, throat, and upper part of fore neck rufous-chestnut, the feathers tipped pale; an elongated glossy green patch from just in front of the eye to the nape; chin and bordering the gape brown, succeeded by a buff border, which passes in a streak above the eye and down beneath the green patch in the form of a white line; just beneath the eyelid a whitish spot; fore neck, hind neck below the rufous, interscapular region, sides of breast, and rump black-brown, finely vermiculated with white; rump ashy brown, mottled with whitish; upper tail-coverts black, paling off into buff at the edges; tail grey-brown, with pale edges; wing-coverts brownish ashy, the greater series broadly tipped with white, changing into rufous on the inner feathers; primaries and inner webs of secondaries plain brown; outer webs of the foremost secondaries velvety black, tipped with white, those of the innermost shining emerald-green illumined with blue; lowermost tertial feathers whitish next the shaft, with a broad black border; beneath white, the feathers of the chest and upper breast with round blackish spots; the abdomen marked with cross rays of paler brown than the flanks; under tail-coverts black, broadly edged with white, the lateral feathers buff; axillaries and centre of under wing pure white; edge of under wing brown.

This dress is assumed in October and worn until the following June, about the end of which a plumage similar to that of the female described below is put on, except that the upper surface is more uniform, wanting the crescentic edgings in a great measure. The larger size of the bill likewise serves to distinguish the male in this dress.

Adult female. Bill not so black as in the male; legs tinged with reddish.

Above dark brown, paler on the hind neck; feathers of the head margined with rufescent grey; lower hind neck and back with pale crescentic bars, which are whitish, except on the upper back and scapulars, where they are rufescent; upper tail-coverts edged with buff-grey; tail darker brown than in male; wing-coverts slightly darker than in the male, innermost part of the white wing-bar not quite so much tinged with rufous; speculum the same, but smaller; tertials narrowly edged with white, with an internal dark border; lores, face, and sides and front of neck whitish, the feathers centred with brown; throat unspotted white, or white with small brown specks; beneath white; lower part of fore neck tinged with fulvous at the margins of the feathers, next to which is a dark ring enclosing a white centre, which is concealed; flanks brown, with white edges and inner lanceolate bands of rufous-buff; axillaries and under wing as in the male.

Young, nestling. Not to be distinguished from that of the Garganey, previously described.

Immature in first autumn. Characterized by its rufescent markings above and by the stronger rufous tint of the chest; the rufous edgings and bands of the scapulars brighter than those of the back; the white wing-bar more

tinged with rufous than in the adult; tertials barred with rufous-buff on the outer webs. Bill blackish grey, fleshy beneath at the base and at the gape.

Obs. I detect no difference in Asiatic and European examples of this species. An interesting Asiatic ally of this Common Teal is the beautiful Lake-Baikal Teal, *A. formosa*, Georgi. It is a larger bird, measuring in the wing, ♂ 8.5 inches, ♀ 8.1. The coloration of the head in the male is striking: the crown and throat are black, and the face buff, with a black white-edged band from the eye to the throat; the back is blue-grey, finely marked. It is the Clucking Teal of Jerdon's work, and has been obtained near Calcutta and in Sindh.

Distribution.—The Teal is said to be tolerably plentiful in some years in the Jaffna peninsula, where it chiefly frequents the head of the lagoon near Ethelemaduivil. In the island of Delft and at the Palverainkadoo lagoon, on the north-west coast, it appears yearly, writes Mr. G. Simpson, in thousands in November, leaving at the end of February. Layard speaks of vast flocks visiting the Jaffna estuary in the months in question, and being shot and sold by the natives in his time for as low a price as $\frac{1}{2}$ d. each. I have made inquiries of several gentlemen who have been from time to time resident in the peninsula, among whom I may mention Mr. W. Murray, of the Ceylon Civil Service, a keen sportsman, and one who has often shot Teal, and I cannot learn that the species is so abundant now-a-days in that locality as it was prior to the date of Layard's catalogue. It extends into the interior, visiting the tanks at Anaradhapura, Madewatchiya, Kanthelai, and other places, among which I have seen it at the small tank at Pankulam. It is found as far south as the Uswewa district, and on the east coast affects the Topoor tank, extending in small numbers down to the Yāla district.

This duck is abundant in parts of India from October until April, but does not occur in such great numbers as the last species, particularly in the Calcutta district. Eastward it is common in Upper Burmah (*Oates*), but is rare in Tenasserim, only having been observed in the plains between the Sittang and the Salween. In the peninsula of India it is common in the Deccan, but does not occur in very great abundance in Chota Nagpur (*Ball*); and in Furreedpore it has not been noticed by Mr. Cripps. In the Nepal valley it is very common; but in North-western India it is perhaps more abundant than elsewhere, being recorded as common at the Sambhur Lake, in Sindh, Cutch, Guzerat, and Kattiawar. It occurs in the Punjab, and in Cashmere and Kashgharia it is very abundant from November until February, but does not stay to breed. It is found on passage in Turkestan, breeding, according to Severtzoff, up to an elevation of 6000 feet; and in the south-western portion of the country it remains throughout the winter. In Mongolia it is extremely abundant, writes Przevalsky, on migration; large flocks were seen at Dalai-nor, and at Koko-nor it was abundant in March, in which month also it appears at Lake Hanka, a few remaining to breed. It is very common in Amoor Land, and abundant at the source of the river and in South-west Siberia. On the Yenesei it appears as soon as the ice breaks up; and Mr. Seebohm found it breeding as high as $70\frac{1}{2}^{\circ}$ N. lat. On the Ob, Dr. Finsch met with it as far north as Obdorsk. Eastward it extends to Kamtehatka. In Japan it is plentiful, remaining in winter in Yesso, the most northerly island. Throughout China and Formosa it is abundant in winter, according to Swinhoe. It does not extend to the Philippines or any further to the south than Formosa. Returning to Western Asia, we find it occurring in Persia; in Palestine Canon Tristram found it common in winter, and in the peninsula of Sinai Mr. C. Wyatt met with it. In Asia Minor it is not uncommon, writes Mr. Danford, in the mountain-rivers. It is common in Turkey, and a resident on the Black Sea (*Nordmann*). It breeds in Greece, and is abundant in the Ionian Isles in winter (*Lilford*). Throughout the southern and central portions of Europe it is more or less plentiful, but does not remain in the summer in all parts, as, for example, in some parts of Italy, where Salvadori is uncertain as to its breeding. It is abundant in Northern Europe in the summer, breeding as far north as Lapland and the White Sea. It is distributed all over Great Britain, breeding even in the southern counties, and occurring in the Orkneys and Shetland. In Iceland it is abundant, arriving there, according to Faber, in April and staying until October. It has been occasionally found in Greenland, and occurs on the eastern coasts of America as a straggler. It has been noticed in the Azores and in Madeira, and in North Africa it is not uncommon from west to east. In Egypt it is in fact very abundant according to Capt. Shelley and Von Heuglin, and is resident there, occurring as far south as the Blue and White Nile and the Somali coast.

Habits.—The Teal, which, owing to the handsome plumage of the male, may be considered one of the

most interesting species of Ducks found within Indian limits, associates in large flocks in the cold season, and affords excellent shooting in jheels and tanks, where reeds and overgrowth afford it cover. Like all Ducks, it possesses great powers of flight, which, however, in the present instance are increased, owing to the powerful wing which the Teal possesses in proportion to its small body; and its great speed on the wing makes it all the more attractive to a keen sportsman. Like the Wigeon and the Mallard, it is almost entirely a night feeder, reposing during the daytime in the sheltered nooks of tanks and lakes, or among reeds in rivers, and sallying out at sunset to some great common feeding-ground. In some countries it resorts greatly to shallow sheltered waters on the coast during the day, and flies in to land at sunset to feed, returning in the morning to the salt water; and during its passage to and from its feeding-grounds it affords excellent flight-shooting. Teal fly in flocks of a dozen to twenty or more, and large flocks are made up of several of these troops or "bunches" as they are called by fowlers in England, which sometimes rise and fall in their rapid progress. It is not a very wary bird; and when put out of reeds or other cover often realights again a little distance off. Its ordinary call-note is a monosyllabic sound like *knäk*; and in the breeding-season it utters another, which Naumann likens to the syllable *krück*. The diet of the Teal consists of vegetable matter (weeds, roots, seeds of water-plants) and also of insects, larva, worms, and so forth.

Nidification.—This species breeds in May and June, resorting to extensive marshes, heaths near water, and large peat-bogs. The nest is made on the ground among grass or rushes or in thick heather, in which latter case it is placed sometimes in the middle of a clump, and so entirely concealed from view that the bird cannot be seen on its nest. The nest is made of dead flags, rushes, grass, reeds, &c., with a capacious interior, which is amply lined with down plucked from the bird's breast. The number of eggs varies from eight to fourteen, and occasionally as many as twenty have been found in a nest; they are small for the size of the bird, oval, but slightly more obtuse at one end than the other, of a uniform creamy-white or pale buff. There is a greenish variety sometimes found, very like the Pintail's eggs. A series before me from the Petehora, taken by Mr. Seebohm, vary in length from 1.58 to 1.7 inch, and in breadth from 1.16 to 1.27. The old birds are said to manifest great affection for their young. Macgillivray relates an instance of his finding a brood of young with their mother on a road; and when he took them up to put them to a pond close by, whither he thought the old bird was leading them, she followed him, fluttering round him within reach of his whip.

The "nest-down" is dark brown, with pale whitish centres, but no pale tippings.

Genus SPATULA.

Bill longer than in *Anas*, compressed at the gape, and widening out from there to the tip, which is boldly rounded; lamellæ very fine, highly developed, extending from the gape round to the nail, and projecting below the edge of the mandible. Wings pointed, 1st and 2nd quills the longest. Tail pointed, of 14 feathers. Tarsus short; feet as in *Anas*.

SPATULA CLYPEATA.

(THE COMMON SHOVELLER.)

Anas clypeata, Linn. Syst. Nat. i. p. 200 (1766); Naum. Naturgesch. der Vög. Deutschl. xi. p. 747 (1842).

Spatula clypeata (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 303 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 796 (1864); Holdsw. P. Z. S. 1872, p. 479; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1331 (1873); Dresser, B. Eur. pt. 21 (1873); Scully, Str. Feath. 1876, p. 199; Sclater & Salvin, P. Z. S. 1876, p. 396; David & Oust. Ois. de la Chine, p. 500 (1877); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Le canard Souchet, Buff. Pl. Enl. 971, 972; *Red-breasted Shoveller*, Lath.; *Blue-winged Shoveller* of some; *Spoon-billed Duck* in India; *De Slobeend*, Dutch; *Pato trombeteiro*, Portuguese. *Kana kaurdak*, Turki (Scully); *Kisch*, Arabic; *Tidari*, Hind.

Adult male. (Europe) Wing 9.1 to 9.5 inches; tail 3.6 to 4.0; tarsus 1.3 to 1.4; middle toe 1.7 to 1.9, claw (straight) 0.4; hind toe 0.4; bill to gape (straight) 3.0 to 3.1, width at tip 1.2, at base 0.55. (Yarkand) "Length 19.8; wing 9.3; tail 3.3; tarsus 1.4; bill from gape 2.85." (Scully.)

Iris reddish orange; bill greyish black; legs and feet reddish orange, claws brownish.

Male after autumn moult. Head and neck black, glossed with blue-green, which reaches almost round the base of the bill and down the throat; this dark colour ends abruptly round the bottom of the neck, below which the lower neck and upper part of chest are white, as are also the upper scapular feathers, the innermost under wing-coverts, and axillaries; centre of the hind neck and interseapular region brownish black, darkening into deep black on the rump and upper tail-coverts, which have a greenish lustre; the feathers of the lower hind neck edged with greyish; scapulars lengthened and lanceolate; the inner longer feathers black, with central white stripes, the outer delicate azure-blue with white central stripes; the tertials (lanceolate) black, glossed with green, and with a handsome central stripe at the tip blending into the dark hue; some of the shorter scapulars mottled with blackish; lesser wing-coverts pale glossy grey-blue; the greater brown, the visible part of the tips white, forming a bar across the wing; secondaries brown, tipped with white, terminal portion of the outer webs brilliant green; primaries brown, with white shafts; tail brown, the central feathers edged with white, and each succeeding feather more deeply marked in the same way, the two lateral pairs being almost white; beneath, from the chest, dark rufous, the centre of the belly darker than the surrounding plumage; under tail-coverts black; the shorter feathers at the vent whitish, stippled with rufous; under wing along the edge brown.

This plumage is worn through the winter and spring until the following June, when the male assumes a plumage very similar to the female below described, but recognizable from that of the other sex by the blue wing-coverts, broad white tips of the greater coverts, and dark green speculum. This livery is worn until the following October, when the above-described handsome plumage is again donned.

Female. (England: coll. Dresser) Wing 8.7 inches; tail 3.8; tarsus 1.4; middle toe 1.7; bill to gape 2.6, at front 2.2. (Yarkand) "Length 17.5; wing 8.35; tail 3.1; tarsus 1.25; bill from gape 2.65." (Scully.)

Iris brown; bill brown, lower mandible yellowish; legs and feet impure orange-yellow, claws brownish.

Head, neck, and under surface glossy clay-buff, unmarked on the chin and upper part of the throat, but the feathers on the head, face, and neck with brown central stripes, very broad on the crown and hind neck; a small space at the front of the lores unspotted; the feathers of the fore neck, chest, and under surface with the central parts brown, here and there concealed on the lower parts beneath the yellow margins, but bold and exposed on the flanks, and very dark on the lower fore neck; interseapular region and scapulars brown, boldly edged with light buff, and some of the scapulars with longitudinal curved stripes of the same; the rump almost uniform dark brown; the shorter upper tail-coverts with crescentic bands of white, and the longer with bar-like spots of rich buff; tail buff, the feathers with lanceolate marks of dark brown near the tips, which pale gradually towards the outer feathers; lower wing-coverts light brown, pervaded with bluish, the greater series broadly tipped with white; the secondaries more narrowly so, brown externally, and washed with green on the outer webs;

tertials terminally margined with white; axillaries and under wing white, the edge of the latter marked with brown.

Young in down (Perm). Head, centre of hind neck, and upper surface glossy dark brown; a dark brown stripe through the lores and behind the eye, joining the brown of the nape; ear-coverts brownish; a whitish spot behind the wing and another behind the legs; face, supercilium, and fore neck dusky buff, the tips of the down being dark, and imparting a dusky appearance; under surface whitish, shading into brown on the flanks; bill black; nail yellowish; legs and feet brown.

Both sexes in first plumage resemble the adult female, according to Naumann, the male having the wing-coverts and speculum brighter than the female. The *young* male assumes its full plumage a few weeks later than the adult, and may be recognized, during its first year, by its paler bill, which is bluish black. The lustre of the head and neck is not so pure, and the upper back not so dark. Iris yellow; legs paler than in the adult. *Immature females* are darker than adults.

Obs. Whether the South-African Shoveller be the same or not as the present species has remained a matter of doubt, owing to the great paucity of specimens to hand from that region. The type is a young bird, and the only specimen in the British Museum is immature. Von Heuglin writes concerning a single specimen that there are

Subfam. FULIGULINÆ.

Head larger and wings shorter than in the last subfamily. Legs short, set further back; the feet large, and the *hind toe lobed* or partially webbed.

With a single moult. Speculum inconspicuous or wanting.

Genus FULIGULA.

Bill rather broad and flattened near the tip, base of the culmen wide; nail short; nostrils advanced; lamellæ broad and shallow. Wings pointed, 1st quill the longest. Tail short and cuneate, of 16 feathers. Tarsus much shorter than the middle toe. Feet very large; webs extending to tip of toes, as likewise the lobe of the hind toe.

FULIGULA RUFINA.

(THE RED-CRESTED POCHARD.)

Anas rufina, Pall. It. ii. App. p. 713. no. 28 (1773).

Branta rufina (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 306 (1849); Jerdon, B. of Ind. iii. p. 811 (1864); Holdsw. P. Z. S. 1872, p. 480.

Fuligula rufina (Pall.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Dresser, B. of Eur. pt. 22 (1873); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Canard siffleur huppé, Buff. Pl. Enl. 928; *Red-crested Duck*, Lath. *Kizil bash aurdak*, lit. "Red-headed Duck," Turki (Scully).

Adult male. (Europe) Wing 10.2 to 10.6 inches; tail 3.3 to 3.5; tarsus 1.5 to 1.6; middle toe 2.5, claw 0.4; hind toe (with claw) 0.7. (Yarkand) "Length 21.0; tail 4.0; tarsus 1.6; bill from gape 2.4; weight 2 lbs." (Scully.) Iris red or reddish brown; bill fine vermilion; legs and feet red, webs dusky, claws brownish.

Male, after autumn moult (Sicily). Head, nape, face, throat, and sides of neck for half its length fine pale glossy chestnut, darkest on the throat and anterior part of the face, and palest on the head, where the feathers from the forehead to the occiput stand erect in the form of a helmet-shaped crest, the nuchal feathers being likewise elongated, but not erect; centre of the nape, back, and lower part of the neck velvety black, this colour running up as

some trifling differences in the bill, that the nostrils are larger, and the middle toe longer. I think it therefore extremely probable that the Cape Shoveller is the same as the common and widely-distributed form.

Other species are:—the Australian Shoveller (*S. rhynchotis*, Lath.). In this the under surface in the male is chestnut, with crescentic bands of black; the face is green, with a white band from the lores to the throat; wing-coverts slate-blue, with a broad wing-bar. The absence of the white chest is the most characteristic difference.

S. variegata, Gould, is peculiar to New Zealand, being there the representative of *S. rhynchotis*; it has the white facial band, the chest, breast, and scapulars whitish, with crescentic margins of black to the feathers.

S. platalea, Vieill., the South-American Shoveller, is ruddy above and beneath, with white spots on the head; lesser wing-coverts blue, median white. "Wing 8.0, bill to gape 2.7" (*Sclater*).

Distribution.—This remarkable and almost cosmopolitan Duck is a not unfrequent winter visitor to Ceylon. I have not met with it myself, but Mr. G. Simpson informs me that it comes in large numbers to Delft and the Palverainkadoo and Mullaitivu lagoons, remaining during the same period as the Teal and Pintail. Layard not only discovered it one year near Jaffna, but found it breeding there at the Chavagacherry lagoon in Mareh. He there met with a female with twelve young ones, most of which he captured, and in the month of November he obtained specimens from native shooters. Its breeding in these latitudes must be considered a most abnormal circumstance.

In India it is a very common bird in some parts, being in Guzerat, writes Capt. Butler, one of the most abundant Ducks. Mr. Hume met with it on large lakes in Sindh, and on the rivers Jhelum, Chenab, and Indus. It is common in Kutch, Kattiawar, and Jodhpoor, and at the Sambhur Lake is very plentiful. It is a winter visitor to the valley of Nepal, writes Dr. Scully, and is common there in migration to and from the Plains. In Lower Bengal it is pretty common; but in the Chota-Nagpur division it is rare, being recorded by Mr. Ball only from the Rajmchal hills, Manbhum, Orissa, and Jaipur. In the Deccan it is not uncommon in

a stripe between the chestnut, and toning down on the lower part of the hind neck and throat into deep glossy brown, which pales on the interscapular region and scapulars into chestnut-brown; lower back, rump, and upper tail-coverts black-brown; wing-coverts light earthy brown, with the margin of the wing, as also a patch at the origin of the scapulars, white; secondaries white, tipped with dark brown; primaries white, with the terminal portions and the outer webs of the first three dark brown, continued as an edging on the next two; tail dark brown, the lateral feathers whitish near the tips; beneath, the dark brown of the chest pales somewhat on the under surface, where the feathers are pale-edged, and intensifies again on the vent and under tail-coverts, which are blackish brown; middle of flanks and the sides of the central parts of the breast white, the feathers tipped with brownish; axillaries and under wing white.

This plumage is worn till the following June or beginning of July, and the male then assumes a livery resembling that of the female; but said to be distinguished from the latter by the brighter-coloured bill and iris, the darker and more rusty hue of the head and the throat, and the more bushy crest, the dark brown of the upper and under tail-coverts and belly, the clear grey wing-coverts, the greyer and whiter-tipped tail-feathers, and the redder feet.

Adult female (Sicily). Wing 9.3 inches; tail 3.2; tarsus 1.5; middle toe 2.4; bill to gape (straight) 2.05.

Iris yellow; bill brownish red above, fleshy beneath, nail brown; legs and feet murky yellow.

Head and occiput russet-brown, the feathers thick and bushy, but not erect; hind neck, interscapular region, scapulars, and wing-coverts pale olive-brown, darkening on the lower back and upper tail-coverts, the latter of which are yellowish brown at the tips and sides; secondaries sullied white, brownish near the tips, which are pure white; primaries buff-white, dark brown at the tips, and the outer webs of the 1st four quills brown; winglet and primary-coverts browner; tail light brown, tipped pale; throat white; under surface brown, the feathers deeply tipped with greyish white, blending into the darker colour, which is most prominent on the chest; axillaries pure white; under wing whitish, tinged with brown beneath the anterior edge.

Young in down. Has a "double olive-grey stripe from the lores, dividing before the eye, and bordering the yellowish-grey eyebrow above and the cheeks and auriculars below; upper parts, crown from the base of the bill, nape,

winter; but further south I imagine it is only of accidental occurrence. I find no record of its having been observed on the eastern side of the Bay of Bengal; but on its migration to the Mongolian regions it no doubt passes up the valley of the Brahmapootra, and thence from the confines of Assam to Koko-nor and the Hoang-ho valley, where Przevalsky found it not uncommon in March. Some few remain to breed at Lake Hanka, but the majority move on. In China it is common in winter, as also in Formosa. To the north it is found throughout Amoor Land, extending to Japan and Kamtchatka. Moving westward now, we find it inhabiting the plains of Kashghar in November and December, but not remaining throughout the winter; in Turkestan we have Severtzoff's authority for its breeding, and being found on passage, in the east and north-west of that country; and further north it has been met with in Western Siberia, and occurs, though not commonly, on the Yenesei as far as the Arctic circle, where Mr. Scebohm procured it. In various parts of Palestine it was obtained by Canon Tristram, and thence westwards it is found in Asia Minor and also in Southern Europe, including Greece and the Mediterranean islands, as a bird of passage from Northern Africa (where it is very abundant in winter) to the northern parts of the first-named continent. Here it occurs in Scandinavia up to the Arctic circle, and in Russia as far as the White Sea, being very abundant in the Delta of the Dwina in the breeding-season, though not so much so on the Petchora further east. It likewise breeds in Central Europe, but in Hungary it is only seen on migration. It is a summer visitant to England and Scotland, breeding in Norfolk, Durham, and Northumberland, as also in Scotland as far north as Elgin. Turning to the south, again, it is not uncommon in Spain and Portugal, and is met with in considerable numbers near the Straits from October until April. In Morocco and in Algeria it is common, breeding in the latter country; and in Egypt it is very abundant, wandering south to the White and Blue Nile, and has been met with the whole year round by Von Heuglin in Abyssinia, at an elevation of from 6000 to 8000 feet. Should the South-African species prove to be the same, the range of this Shoveller will extend to the neighbourhood of Cape

back, and wings dull olive-grey, excepting the spot on the shoulder, which, with the rest of the body, is pale yellowish grey; iris dark brown; bill reddish brown, with the nail white; feet ash-grey, with a greenish tinge, webs and toes narrowly edged with yellowish white." (*Dresser, fide Baldamus.*)

Young male. "Resembles the female, but has the crest much fuller and more rufous in colour, in tinge much closer to that of the male, only duller." (*Dresser.*)

Young female (Yarkand). Wing 8.9 inches. "Bill dusky above, brownish below; legs and feet dusky, yellowish green in parts." (*Scully.*)

Distribution.—A Duck, identified with the Red-crested Pochard, was met with by Layard in the Jaffna peninsula, concerning which he writes as follows:—"I introduce this species with a mark of doubt, because I only know them through my telescope. I saw two or three pairs for several weeks on a piece of brackish water between Jaffna and Chavagacherry; they would not allow me to get within 250 or 300 yards of them, and I therefore never managed to shoot one. A head of *F. rufina*, however, which I received from Calcutta, was identified by a native as of a bird he knew and had killed on that very piece of water, though he had not seen them elsewhere." Subsequently he writes me that he is sure he identified the bird correctly; but, in accordance with the practice adopted throughout the work, I doubtfully introduce the species into it. According to Jerdon it is found throughout the greater part of India, but is more rare in the south. I find it recorded recently from the Deccan (*Fairbank*), from several parts of Chota Nagpur, in the Manbhum district of which province it is not rare (*Ball*), as being very common near Calcutta, as a straggler from Furreedpore; and, on the north-western side of the peninsula, as found in Cutch, Kattiawar, Sindh, Guzerat, and Jodhpore. It occurs on large tanks in Guzerat, and on lakes in Sindh; and is common at Sambhur in the cold weather (*Adam*). It likewise is found in the Punjab, Cashmere, and Oudh. It breeds throughout Turkestan, and is resident in the south-west of that country; at Yarkand it is a summer visitor (*Scully*). It does not appear to extend into Central Asia, but ranges westward through Palestine to South-eastern Europe, where it is found in Greece, Turkey, Southern Russia, and also in Hungary, extending thence into Bohemia and Southern Germany. It is found in Italy, Malta, Sardinia, and Sicily, breeding in the two latter islands. In Spain it is mostly confined to the east coast, being common at Valencia, and very

Town, but where, according to Layard, it is rarely seen. North of Damara Land it will probably be found to occur at various points of the coast. At present we know that it has been noticed as far south as Senegambia. Finally, before quitting the Old World, it is interesting to remark that it has occurred as a straggler in Australia (having wandered thither most likely from China), as Gould records its occurrence in New South Wales in his 'Handbook of Australian Birds.' In another direction it has been found, according to Hartlaub, in the Sandwich Islands. In America it has occurred on the west coast as far north as Alaska, and in the east inhabits parts of the United States in the breeding-season, and is found in Texas and Florida, and likewise in Mexico and Guatemala, in which latter region Mr. Salvin procured it and found it common in winter. In

rare in Andalucia. It is a straggler to France, Belgium, and Northern Germany, as also to Great Britain, where it has chiefly occurred along the south coast and in the eastern counties. It has been obtained in Scotland, which is about its most northern limit, and it is doubtfully recorded from Sweden (Gothenburg). It is said to have bred in Denmark. Lastly, in Northern Africa it has been met with in Morocco, in Algeria, and in Egypt, in the second of which countries it appears to be common, and where Mr. Salvin found it breeding at Zana.

Habits.—This handsome Pochard, though belonging to the family of diving Ducks, which are mainly characterized by their webbed or lobed hind toes, is said by those who have observed its habits not to dive for its food, but to feed, like ordinary Ducks, in shallow water, with its neck stretched down and body turned up. When occasion offers, however, it can dive excellently; and Dr. Scully, who observed it in Kashgharia, speaks of a habit which is peculiar to diving-birds that swim with speed beneath the surface, remarking that it emerges from the water with a sharp spring, and further that it "carries its head well bent back over its shoulders, and is not easily approached." It frequents fresh water in preference to salt, and does not associate in large flocks. In India it is found in large tanks and jheels, and is very difficult to shoot, getting up, writes Captain Butler, at the least sign of danger, and flying up and down invariably out of gun-shot. Naumann describes its call-note as being very harsh, like the croak of a Crow, and says that it is only uttered when the bird is put up. The food of this species consists of vegetable matter—water-plants, grain, &c., and its flesh is consequently excellent; it, however, feeds on frogs' spawn and small shell-fish as well.

Nidification.—This species breeds in May and June; several localities have been mentioned in my account of distribution, the nearest to India being the vicinity of Kashgharia and Turkestan. The nest is placed among rushes and flags, and is made of reeds, grass, rushes, and leaves, resembling, according to Canon Tristram, that of a Coot, being, however, lined in the usual manner with down and feathers. The eggs vary from seven to nine, and before being blown are "fresh green;" but this tint fades after the preparation of the specimen, and they become greenish grey. Three eggs average in size $2\frac{1}{4}$ (0.27) by $1\frac{3}{4}$ (0.6) inch (*Dresser*).

Note.—*FULIGULA FERINA.* Another Duck of this group likely to occur in Ceylon is the Common or Red-headed Pochard (*Anas ferina*, Linn. S. N. i. p. 203). It is found in the cold weather in many parts of India, being common in the north-west portions of the empire and in portions of Bengal; it may therefore occasionally migrate as far south as Ceylon. I have been informed that Mr. Varian, of the Public Works Department, has shot a Duck on Topoor tank, which he styled the "Canvas-back," and which may have been this species. A male in my possession measured in the flesh—length 18.5 inches; wing 8.0, expanse 31.0; tail 3.0; tarsus 1.5; middle toe 2.6; bill to gape (straight) 2.2. Iris golden yellow; bill blackish leaden; legs and feet dark plumbeous. Entire head and upper neck rufous chestnut-brown; neck before and behind and upper chest black; upper back, scapulars, and under surface white, finely vermiculated or cross-rayed with dark grey, less on the breast than elsewhere; upper and under tail-coverts black; wings slaty grey, mottled on the coverts and near the tips of the secondaries with white; tail dark grey. It is found throughout Europe and Northern Africa, as also the warmer parts of Asia, breeding in the north of the latter continent, but not extending eastwards in Siberia of Lake Baikal, although, from native drawings of it, it appears to have occurred in Japan. It is distributed throughout China in the winter. In India it is found, according to Jerdon, in small parties in tanks and jheels, and, as its flesh is excellent eating, it is much sought after. It is not particularly shy, and has been noticed to swim out of the way of danger rather than to take wing. It is very like the Canvas-back Duck of America, differing from that species in its smaller size.

the West Indies it is, according to Gundlach, a regular winter visitant to Cuba, and in Jamaica it is said to be numerous.

Habits.—This remarkable Duck, which is peculiar in being the only widely-distributed species of the little group to which it belongs, is almost entirely a frequenter of fresh water, affecting the margins of ponds, lakes, marshy rivers, and jheels, where it feeds in shallow places among weeds and vegetable matter. It searches for its food chiefly in mud, and subsists to a great extent on worms and aquatic insects, which its peculiar comb-like lamellæ enable it to sift out of the earthy matter in which they are found. Its flesh is said by most writers to be very inferior eating; but, notwithstanding, it is frequently shot, as it is not at all shy, and its handsome plumage presents a bait to the sportsman. The Shoveller, although it collects in great numbers in one locality when suitable feeding-grounds attract it, usually goes in small parties, which keep a little apart from one another, and often mix with a few individuals of other species; Jerdon, for instance, notices that it is often to be seen with the Gadwall, which is very abundant in India.

Nidification.—The Shoveller breeds in May and June, the regions nearest India to which it resorts to for this purpose being Turkestan and Mongolia, in which latter Prjevalsky found it nesting in the Hoang-ho valley. In Europe it lays in the most secluded parts of marshes and swamps, making a nest of flags, rushes, reeds, sedges, &c. on a dry spot, and lining it with feathers and down. The eggs vary in number from eight to twelve; they are very pale stone- or grey-green, rather long ovals slightly compressed at one end, smooth in texture, with a slight gloss. The dimensions of three examples in a small series from the Petchora are 2·18 by 1·48, 2·19 by 1·54, 2·14 by 1·4 inches respectively.

The “nest-down” is small, dark brown, with small plainly-defined whitish centres, without pale tips.

Note.—I have sportsman’s authority for the occurrence of the Mallard (*A. boschas*, Linn.) in the Jaffna district; but I am inclined to think that the Indian Wild Duck has been mistaken for it.

ANSERES.

Fam. PHŒNICOPTERIDÆ*.

Bill very large, high at the base, suddenly bent down about the centre, with a corresponding angle in the commissure. Legs very long.

Not of natatorial habit. Sternum with a single deep notch in each half of the posterior edge. Loral space bare.

* The Flamingoes are placed by some systematists among the *Herodiones* (Hérons, Ibises, &c.), with which isolated group they have nothing in common, except length of leg and a partial resemblance in their mode of feeding. They constitute a specialized and somewhat aberrant Anserine form; their young, which are autophagous, their eggs, and their nidification (though somewhat peculiar) are those of this order: in the lamellæ of the bill and the fleshy tongue they possess the great characteristics of the Anseres; the sternum is Anserine, and, finally, the body is set horizontally on the legs like that of a Goose, and not held upright as in the Herons.

Genus PHÆNICOPTERUS.

Bill deep at the base, straight and somewhat cylindrical for half its length, with the culmen slightly keeled, then suddenly bent down and horizontally compressed; the culmen flattened; commissure ascending from the gape to the point of depression of the culmen, then angulated and running parallel to the latter; nostrils linear, advanced, placed near the commissure; margins of both mandibles furnished with fine lamellæ. Wings pointed, the 1st quill the longest. Tail short. Legs very long; the tarsus scutellate in front. Feet webbed, the exterior edge emarginate; hind toe small.

PHÆNICOPTERUS ROSEUS.

(THE COMMON FLAMINGO.)

Phœnicopterus roseus, Pall. Zoogr. Rosso-As. ii. p. 207 (1811); Blyth, Cat. B. Mus. A. S. B. p. 299 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 775 (1864); Dresser, B. of Eur. pt. 75, 76 (1879)

Phœnicopterus ruber, Sykes, P. Z. S. 1832, p. 159.

Phœnicopterus antiquorum, Temm. Man. d'Orn. ii. p. 587 (1820); Holdsw. P. Z. S. 1872, p. 479; Heuglin, Orn. N.Ost-Afr. ii. p. 1263 (1873); Hume, Str. Feath. 1879, p. 114 (List Ind. B.).

Flammant, Buffon, Pl. Enl. 63. *Nihaf*, Arabic; *Bag hans*, lit. "Heron Goose," also *Raj hans*, Hind.; *Krop-gans*, Dutch in Ceylon; *Kan-thunti*, Bengal.; *Pu-konga*, Telugu; *Pu-nari*, Tamil; *Inglis Koku*, lit. "English Heron," from a fancied resemblance to soldiers; *Urian*, Jaffna Tamils.

Adult male? (Ceylon, Poole collection). Wing 16·0 inches; bill along culmen 5·8.—*Adults* (Brit. Mus.). Wing 16·5 to 17·5; tail 6·0; bare tibia 9·0; tarsus 13·2; middle toe with claw 3·7; bill along culmen 5·7, depth at centre 1·5.—*Male* (Sambhur Lake). Length 50·0; wing 17·5; tail 6·0; tarsus 14·9; bill along culmen 6·4. *Female*. Length 40·2; wing 15·0; tail 5·1; tarsus 10·4; bill along curve 5·6 (*Adams*).—*Male* (South Africa). Wing 16·08; tail 6·25; bare tibia 7·66; tarsus 11·5; bill at front 5·08. *Female* (Tripoli). Wing 14·03; tail 5·25; bare tibia 7·75; tarsus 10·5; bill at front 4·75 (*Von Heuglin*). The female of this species is smaller than the male.

Iris pale yellow; bill rosy red, terminal half black; loreal skin whitish pink; legs and feet pinkish red, claws black.

Living example (Zoological Gardens). Plumage white, tinged with rosy, particularly on the neck, the region round the eye being brighter than elsewhere; the interscapulars tinged with cerise, the tertials pale scarlet at the tips; the bastard wing and primary-coverts light scarlet, passing into rosy white on the inner webs; primaries and secondaries black; scapulars lanceolate in shape and with dark shafts; under wing at the edge scarlet; axillaries bright scarlet; median under secondary- and under primary-coverts black.

Young in down. "Covered with close down, in texture like that on a young Swan; entire plumage white, the upper parts slightly tinged with dusty grey." (*Dresser*.)

Nestling just fledged. Wing 13·5 inches; tarsus 6·5.

Head, neck, and under surface white, faintly tinged with rosy; back and wing-coverts reddish sandy, with dark shaft-stripes; the greater wing-coverts terminally brown, with pale margins; primary-coverts sandy, with sharply defined black tips; quills black.

In a bird of the year (B. Mus.) the plumage is white, the scapulars with dark shafts, and patched near the tips with dark brown; the wing-coverts with brown-edged pale centres increasing on the greater series, which have the outer webs dark for one third of the length, and the inner webs tipped with brown; primaries and secondaries black; tertials brown near the tips.

Obs. A smaller species of Flamingo, *P. minor*, G. St.-Hil., visits the north-western portions of India in the cold season, coming from the west, its summer habitat being Africa. Its dimensions are—wing 12.5 to 13.75 inches, tarsus 7.0 to 8.4. Its plumage is much redder than in *P. roseus*, and especially in the breeding-season, when the throat is bright rose-colour, each of the feathers of the breast broadly centred towards the tip with cerise; the scapulars are rosy white, overlain by a number of long elongated, intensely cherry-coloured plumes; the secondaries, lesser and median wing-coverts brilliant cherry-colour, with narrow white tips; lower tail-coverts, flanks, and vent-feathers bright rosy, tinged with cherry-colour (*Hume*).

Distribution.—The Flamingo is frequently seen in large flocks on the east coast of Ceylon, from Jaffna southwards to Trincomalee, and from Batticaloa round to Hambantota. It is likewise met with on the west coast as far south as Puttalam, at which place large numbers are sometimes seen. I have myself seldom seen it in the Trincomalee district; but near Kirinde and Hambantota have met with numbers in March. It is for the most part, so far as I could ascertain, a migratory species, appearing in the island in October and November, and leaving again in April; but it is said by the moormen on the south-east coast to breed between Yāla and Batticaloa; and if this be the case it must be resident in this part of the island. This is a matter, and a very interesting one too, for future investigation; for as the bird does not nidificate in India, its nesting in Ceylon would be a remarkable feature in its economy.

In India it is abundant in some coast-districts, but towards Calcutta becomes rare. Jerdon writes as follows:—"It is abundant near Madras, in the Pulicat Lake; also between Madras and Pondicherry, and south towards Tuticoreen; it is also met with in the Northern Circars, at the great Chilka Lake, south of Cuttack, and occasionally near the mouth of the Hooghly and some of the Soonderbun rivers. In Central India and the Deccan flocks generally visit some of the larger tanks during the cold weather." Messrs. Davidson and Wenden recently state they have but rarely observed it in the Deccan; and the Rev. Dr. Fairbank remarks that it sometimes visits the larger collections of water there and also the salt-pans in Bombay. In Sindh it is exceedingly numerous, Mr. Hume having met with it on the larger lakes of the Province in tens of thousands. "It is," he says, "a wonderful sight to see one of these enormous flocks rise suddenly when alarmed; as you approach them, as long as they remain in the water at rest, they look simply like a mass of faintly rosy snow. A rifle is fired, and then the exposure of the upper and under wing-coverts turns the mass into a gigantic brilliantly rosy scarf, waving to and fro in mighty folds as it floats away." It is very common in Guzerat and Kattiawar, but less so in Cutch and Jodhpoor, except at the Sambhur Lake, where it occurs in great flocks in the cold weather, remaining sometimes, when the season is wet, until May. Further north it is not uncommon in the Punjab. It is not found to the east of the Bay of Bengal, nor in the Mongolian or Chinese region, and it does not appear to range eastward of Turkestan, except as a rare straggler. Mr. Dresser states that it has been shot once at Lake Baikal; but this is the only record I find of its occurrence in Siberia. It is met with as a straggler, according to Severtzoff, in the western parts of Turkestan. Mr. Blanford found it on the Baluchistan coast, and further observes that it is said not to be uncommon on the Caspian, on which sea, I gather from other sources, it is principally found near the mouth of the Emba and on the shores of the gulf of Mertvoï-Koultouk. Elsewhere, in Persia, Major St. John met with it on the Shiraz plains. In Palestine Canon Tristram found it affecting the Kishon in winter, and also met with it in flocks in other parts; in Asia Minor, however, it is rare, and on the Black Sea is less common than on the Caspian. In Greece it is rare, but in Turkey not uncommon, although to the north on the Danube it does not seem, according to Mr. Dresser, to have occurred.

Its principal habitat in Europe appears to be Spain and Portugal, where it breeds, and the island of Sardinia, where it occurs in large numbers in the winter, from August till April, sometimes remaining until June. An extensive migration takes place from North-western Africa into Spain from February until May, the birds returning, according to Major Irby, in September; and this naturalist states that they breed in the marismas of the Guadalquivir. They do not all return, however, to Africa, as numbers are seen in

the winter in many places, among which may be mentioned the island of Iviza and Formentera. It is also found in winter in the Balearic Islands. In Malta it is only observed at irregular intervals, and in Italy it is not so common as in Sardinia. It is tolerably common in the south of France, and is said, writes Mr. Dresser, to inhabit the marshes of the Camargue and Aigue-Mortes. It is rare in the north of the country, and does not range as far as Holland or Belgium, although it is a straggler to Germany and has been seen on the Rhine in a considerable flock. It has extended as far east as Pomerania, but does not appear to be known in Poland or Central Russia.

In Africa it is abundant, according to Favier, in Morocco, migrating northwards through that country in April and May, and returning from August until December. In Algeria Loehe found it at the large lakes; and Mr. Salvin speaks of vast numbers frequenting the lakes and lagoons near Tunis. In Egypt it is abundant, writes Capt. Shelley, in large brackish lakes, but is rather rare on the Nile itself. Von Heuglin, besides meeting with it in the same districts and at Suez, observed it as far south as the White Nile. It extends down the east coast to Mozambique, and thence into Cape Colony, where it is common, and said to breed at a place called Verloren Vley. Up the west coast it is very abundant in Damara Land, extending inland, according to Mr. Andersson, as far as Lake Ngami, and probably breeding to the north of Walvisch Bay, as also on Lake Ngami. It is likewise a visitor to the islands of the Atlantic, for Dr. Bolle records it from Canaria, and Dr. Dohrn and Captain Dampier testify to its occurrence in the Cape-Verd Islands.

Habits.—This remarkable bird passes its time wading in salt lakes and brackish lagoons, rarely ever being seen out of water, at the bottom of which it scoops up its food with the bill inverted, a position which this organ takes owing to the bird's neck assuming a perpendicular position when feeding, and the culmen being at the same time so much curved at the tip. The flattened upper mandible when thus inverted is exactly suited for either a scooping movement towards the bird's feet or a lateral motion, by means of which I suspect it takes in its food to some extent. It feeds on vegetable matter, animalculæ, and very small insects, worms, and crustaceans, rejecting the refuse through the lamellæ in the same manner as Geese and Ducks. It is extremely wary as a rule, though we read that when it first arrives in India it can be more easily approached. Owing to the open ground generally surrounding shallow brackish lagoons, and the fact of the bird usually wading at some distance from the shore, it is impossible to get near it once it becomes wary. In the south-east of Ceylon it is able to wade in the centre of the large leways when they are not very full, and it is then not possible to get a shot at it. The Flamingo is highly gregarious, associating in vast flocks, and when put up on the wing flies in a long line, portions of which, during the course of the birds, advance or fall behind, reminding the beholder, as Mr. Hume aptly writes, of a gigantic scarf. On the wing the neck is stretched to the front and the legs carried straight out behind; it rises from the ground with difficulty, striking the water with its wings before acquiring sufficient momentum to get fairly on the wing, after which it progresses with a steady flight. When a large flock are disturbed they rise with loud cries; the note, as I have heard it in the captive bird, is a hoarse cackle of two notes, in tone like that of a Goose. The Flamingo swims well; but Mr. Hume remarks that it carries its neck nearly straight and bent forward, not curved like that of a Swan, and at every stroke the leverage of its long legs naturally causes the head to jerk.

Nidification.—That the Flamingo nests in Ceylon is, I think, probable, although the locality is a very abnormal one. I have been informed that young birds have been brought to Hambantota from the direction of Batticaloa, and its peculiar mode of nesting was likewise described to me with tolerable correctness. It has not been discovered breeding anywhere in India; for, as we have seen, it leaves the country about May, and probably migrates into Persia and Arabia, if not to Northern Africa, to nest. Ornithologists of the present era have been singularly unfortunate in not discovering its breeding-haunts and obtaining perfectly reliable information concerning its nidification. Accounts received, however, from various parts of the world from the inhabitants of the districts in which it rears its young all point to the fact of its making a conical nest of mud with a hollow in the top for the reception of the eggs, and that the bird sits upon the latter with her legs dangling down. My friend Mr. Saunders endeavoured to find a breeding-place in Spain, but being unsuccessful he obtained (Ibis, 1871, p. 394) an account of the nesting of the bird from a Spaniard who

accompanied him on his trips ; and this is in part as follows :—" The Flamingo always makes its nest in the flattest part of the marsh, in places where there is from three to four inches of water. The nest, which rises to about half a yard above the surface of the water, is made of mud, like that of a Swallow ; its shape is almost cylindrical, but somewhat wider at the base. There is a slight concavity for the eggs, oval in shape, like the shape of the inside of a hat. When the bird is sitting, she has her legs stretched out behind, hanging in the air (that is to say, unsupported), like the arms of a man when he puts them behind his back and throws his shoulders forward. The complement of eggs is five ; and the birds, when once frightened from their nests, do not return. To raise itself the bird 'scrambles' with its feet on the side of the nest till it lifts its body clear, and then it takes wing."

Further evidence is given by Captain Dampier, who wrote as far back as 1729, concerning the Flamingo as observed by him in the Cape-Verd Islands. From Mr. Dresser's work I transcribe the following passage from Dampier's 'Collection of Voyages,' i. pp. 70, 71 :—" They build their nests in shallow ponds, where there is much mud, which they scrape together, making little hillocks, like small islands, appearing out of the water, a foot and a half high from the bottom. They make the foundation of these hillocks broad, bringing them up tapering to the top, where they leave a small hollow pit to lay their eggs in ; and when they either lay their eggs or hatch them, they stand all the while not on the hillock but close by it, with their legs on the ground and in the water, resting themselves against the hillock, and covering the hollow nest upon it with their rumps ; for their legs are very long ; and building thus as they do upon the ground they could neither draw their legs conveniently into their nests, nor sit down upon them otherwise than by resting their whole bodies there, to the prejudice of their eggs or their young, were it not for this admirable contrivance, which they have by natural instinct. They never lay more than two eggs, and seldom fewer. The young ones cannot fly until they are almost full-grown, but will run prodigiously fast ; yet we have taken many of them. The flesh of both young and old is lean and black, yet very good meat, tasting neither fishy nor any way unsavoury. Their tongues are large, having a large knob of fat at the root, which is an excellent bit, a dish of Flamingos' tongues being fit for a prince's table." The eggs are similar to those of a Gannet, but more pointed at one end ; the texture is chalky, and they are white in colour with a green interior surface. I am indebted to Mr. Dresser for the measurements of two in his collection, which are as follows—3·64 by 2·3 and 3·5 by 2·25 inches respectively.

Order HERODIONES*.

Bill long, stout, straight and pointed in most, but curved in one group. Tarsi and feet long, the hind toe on the *same plane* with the anterior ones; middle claw serrated in one family. Toes webbed at the base, in many only between the outer and middle.

Young *heterophagous*, or helpless at birth, and requiring to be fed by the parent. One family (Ardeidæ) furnished with patches of down on the breast and groins.

Fam. PLATALEIDÆ.

Bill long, variable in character, in most curved, in some flattened, the tip expanding into a spatule; nostrils basal. Wings long. Tail short. Legs long; tibia bare much above the knee. Tarsus reticulate. Toes moderately short, joined at the base by a web.

Of large size. Sternum with two notches in the posterior edge. Tertials often elongated.

Genus PLATALEA.

Bill long, straight, flattened throughout, the tip spatulate or expanding into the shape of a spoon-handle; the extremities both decurved, that of the upper mandible projecting considerably over the under; nostrils situated in a groove covered by a membrane, the openings tubular; base of bill furnished with a more or less developed pouch. Wings with the 1st quill nearly as long as the 2nd and 3rd, the 2nd the longest. Legs moderately long, the tarsus reticulate in front. Toes considerably webbed at the base; the outer web much deeper than the inner.

PLATALEA LEUCORODIA.

(THE SPOONBILL.)

Platalea leucorodia, Linn. Syst. Nat. i. p. 231 (1766); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 763 (1864); Holdsw. P. Z. S. 1872, p. 478; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1122 (1873); Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 628 (1875); id. Str. Feath. 1879, p. 114 (List B. of Ind.).

Platea leucorodia (Linn.), Dresser, B. of Eur. pts. 23, 24 (1873).

* The heterophagous nature of the young of this order completely remove it from the Grallatores, with which many have associated it, and ally it unquestionably with the Steganopodes, which I place next to it.

Spatule, Buff.; *White Spoonbill*, Lath.; *Lepelaar*, Dutch in Ceylon. *Chamach-buza*, lit. "Spoon-Ibis," Hind.; *Chinta*, Bengal.; *Genta-muku konga*, Telugu; *Abu Mala qah*, Arabic; *Chapy-chundan*, Tamil (Layard).

Male (Sindh). Length 33.25 inches; wing 15.3, expanse 58.0; tail 5.0; tarsus 6.2; bill at front 8.4, varies in individuals from 8.2 to 9.7 (*Hume*).—*Adults* (England: Brit. Mus.). Wing 14.8 to 14.9 inches; tail 4.5 to 4.8; tarsus 4.8 to 5.2; middle toe and claw 3.2; bill at front 7.1 to 7.4.—*Adult* (Egypt). Length 29.0 to 31.0 inches; wing 12.0 to 13.5; tarsus 4.0 to 5.0; bill at front 6.65 to 7.0 (*Heuglin*).

Iris red; bill black, the plate or terminal portion yellow, with a black edge; loreal space yellow; gular skin reddish yellow; legs and feet black. The gular skin extends down the throat in adults for a distance of $2\frac{1}{2}$ to 3 inches from the base of the lower mandible.

Breeding-plumage (England: Brit. Mus.). Entirely white; sides and lower part of the neck buff-yellow, and a tinge of buff at the sides of the throat; an ample crest of long, decomposed, occipital feathers $2\frac{1}{2}$ to $3\frac{1}{2}$ inches in length.

Winter plumage. Similar to the summer dress, but without the crest, and more of the bill yellow.

Young. Bill dark ashy (*Jerdon*). Covered with white down; the bill with the plate from the time of birth—in fact I have found it well developed in the embryo before birth.

Immature (Holland). Wing 10.6 inches; tail 3.75; tarsus 4.8; bare tibia 3.8; bill at front 3.6. Bill yellow; iris brown; bare portion of skin at the base of the under mandible not developed. Plumage white, with the exception of the terminal portion of the first four primaries, which is blackish slate-colour; the shafts of the primaries, secondaries, and primary-coverts are black.

Obs. Indian specimens, judging by published data, are as large if not larger than European; an example in the British Museum has the bare gular skin reaching $2\frac{1}{2}$ inches down the throat. I have not had an opportunity of comparing Ceylonese skins with those from other parts, as I was unable to procure a specimen while in the island, and have never met with this species in the collections of others. Von Heuglin looks upon the resident birds in Egypt as smaller than European, although there is but little difference in the eggs.

The Spoonbill of China and Japan has been separated by Temminck as *P. major*; but specimens which I have examined, collected by Mr. Swinhoe, are no larger than Indian birds, nor have they longer legs. It differs, however, in having scarcely any naked skin at the base of the bill. Males from China, before me, in Mr. Seeborn's possession, measure—wing 14.75 to 15.0 inches, tarsus 4.75 to 5.0, bill at front 7.6 to 7.9; the bill is black, with the tip yellow. A March specimen has the bill yellow; and an immature bird has the tips of the quills blackish.

There are two species in Australia (*P. melanorhynchus*, Reich., and *P. flavipes*, Gould). The former has the facial skin and all the bill black, and the latter has the bill and legs yellow. *P. tenuirostris*, Temm., found in Africa, has the legs and feet rosy red and the bill bluish green. All these species have the plumage white.

Distribution.—The Spoonbill is not an uncommon bird in the south-east of Ceylon and in the tank-districts of the northern half of the island. I have never seen it in large flocks, and I do not think it is an abundant species anywhere, though it is widely distributed in the regions in question. I found it breeding at Uduwila, near Tissa Maha Rama; but it was so wary, in spite of its eggs being endangered, that I could not succeed in getting any specimens. It is to be met with further north about Yāla, and thence towards Batticaloa. It is often seen about Kanthelai tank and in the Mullaitivu district. Mr. Parker informs me that it is tolerably common in the North-Central Province, and here and there found in the North-western Province about Puttalam and Kurunegala. Further south it is found at Chilaw, but not lower down the coast; and I have not heard of its occurrence anywhere in the south-west of the island, though Layard says it extends westward of Hambantota to Tangalla, which is about the limit of all such large dry-elimatic species.

This bird is generally distributed throughout India, but is nowhere very abundant. It is common in parts of the Deccan, breeding there in April and May (*Davidson*). Further north, in the direction of Chota Nagpur, Mr. Ball records it only from Orissa, north and south of the Mahanadi river, and from Raipur. It is not common about Calcutta, and is omitted entirely from Mr. Cripps's Furreedpore list. I find no mention of it to the eastward of the Bay of Bengal; and beyond the Burmese countries, in China, it is replaced by

P. major. Turning westward to India again, it is distributed throughout Bengal towards Rajpootana and Sindh, in which provinces, as well as in the surrounding region, it is more or less common. Mr. Hume met with it in large flocks along the larger rivers of the Punjab, and on the Indus in Sindh; but on the lakes and broads it was not frequent. To the north of India I do not find it recorded by Dr. Scully from Kashgharia, and in the Mongolian region it is, according to Prjevalsky, replaced by the Chinese bird. In Turkestan, writes Severtzoff, it occurs on passage in cultivated districts up to 4000 feet, and breeds in the south-eastern and north-western districts of the country. It extends northwards into Siberia; and Radde met with examples in the Ussuri country in the far east which, he says, do not differ from the European bird.

It is apparently rare in Palestine and Asia Minor, but is common, according to Von Nordmann, on the shores of the Black Sea, as also along the Danube as far up as Hungary, in both of which districts it breeds. It is also found on the Caspian. In Greece it occurs in large numbers on passage about the time of the equinoctial gales; and Lord Lilford writes that it is common about Petala and the Gulf of Lepanto. It is seen on migration in Malta and Sicily, but in Sardinia is common in the winter. In Tuscany, however, it is met with chiefly in the spring. In Southern Spain it is a bird of passage likewise, being abundant in the marshes of the Guadalquivir, where it occasionally breeds, according to Lord Lilford. It is a summer visitant to Holland and Germany, but is mostly a bird of passage in France, and is now-a-days only a straggler in summer to the British Isles, although in the early part of the last century it bred in the eastern counties. It has been frequently obtained in Ireland as a stray visitor, and has occurred in Scotland, as also in the Orkneys and Shetlands, and is now, according to Mr. R. Gray, an occasional visitor to the Hebrides. In Denmark and Scandinavia it is very rare, although it wanders as far north as Lapland and Finland, and has even once occurred near Archangel. Concerning its occurrence elsewhere in Russia Mr. Dresser writes:—"Sabanäeff records it from the Government of Vladimir; and Bogdanoff met with it in the spring at Lizran. Sabanäeff found it breeding on the skirts of the Shadrinsk and Cheliabinsk districts, and met with it as high as $56\frac{1}{2}^{\circ}$ N. lat." It is found in Poland, and is said to nest in the marshes of Silesia. Turning now from this outline of the Spoonbill's distribution in Europe to the continent of Africa, we find it recorded by Favier as migrating through Morocco in March, April, and May, and returning in October; but it is not found there in winter, although Loche speaks of it as occurring in Algeria at all seasons. Captain Shelley writes that it is plentiful in Egypt and Nubia, while Von Heuglin met with it along the shores of the Red Sea and southward to the Somali coast; in the Dahlak archipelago he visited large breeding-colonies in June. Southward it is replaced by the allied species, *P. tenuirostris*, which extends to Natal. I do not find it recorded from the west coast of Africa; but nevertheless it occurs in the Canaries as a visitor, and also in Madeira and the Azores.

Habits.—From my experience of the Spoonbill in a state of nature I should say it was a very shy bird. I found that when frightened away from their nests those which were met with near Tissa-Maha-Rama flew round and round the tank, and crossed and recrossed it, keeping high up in the air, but would not come near the trees in which their nests were placed so long as I was there. It flies rapidly, with powerful strokes of the wings, carrying its neck straight out. Small flocks, as I have observed them, fly together, but large numbers, writes Von Heuglin, form a singular double line, or sometimes a triangle with unequal sides. When perched on the tops of trees or resting on the ground the neck is gracefully curved and the body held tolerably upright; "while moving about in search of food," remarks Mr. Dresser, "it walks leisurely and slowly, and has a peculiarly grave and sedate gait, as if determined to quarter the ground in a thoroughly business-like manner, and not to hurry itself." It is said by Naumann to have a deep note, and to be noisy at its breeding-places; I did not hear it utter a sound at Uduwila. It makes a clattering noise with its bill, like the Stork. Its food consists of insects, larvæ, small crustacea, frogs, &c. more than fish; and when feeding in shallow water it moves its bill from side to side, taking up its food with the curious spatule at the tip.

The Spoonbill frequents marshes and the borders of freshwater lakes, tanks, and rivers.

Nidification.—In the south-east of Ceylon this species breeds in March. Six or eight pairs were nesting at Uduwila in 1872, the nests being placed on the same trees with those of the Pelican-Ibis; they were situated low down, and in some cases small branches were bent down to form a foundation for the structures, which were made of tolerably large sticks and were rather massive. The eggs, which were two in number,

were reposing on a lining of small twigs; they were broad ovals, pointed at one end, coarse in texture, dull white, with a few light rusty-brown or sepia-smeared blotches near the larger end. The dimensions of two specimens are 2.5 by 1.85 and 2.45 by 1.8 inch.

In India, according to Mr. Hume, it often breeds in very large colonies together with nearly-related species, notably "Shell-eaters," nesting on tamarind- and peepul-trees frequently in villages. He describes the nests as large platforms of sticks from 2 to 3 feet in diameter. In most, the number of eggs does not exceed four, although a few contain five. The markings consist more or less of smudgy and ill-defined blotches and spots, with here and there a hazy spot, streak, or cloud intermingled; in some eggs they are clear bright brown, reddish brown, and even almost black, while in others they are yellowish brown or pale sepia. The eggs vary from 2.4 to 2.95 inches in length, and from 1.68 to 1.95 in breadth.

This species occasionally nests on reeds when there are no trees in the localities in which it has taken up its quarters. The nests in this case are constructed of "reeds bound together by weeds, which are piled up a few inches above the water's edge; over this dry reeds are placed in various directions to form the body of the nest." Nests of this description were found at Erzeroum by Messrs. Dickson and Ross, and described in the Proc. Zool. Soc. 1839.

Genus TANTALUS.

Bill very large, wide at the base, and much compressed to the tip, which is curved and cylindrical in both mandibles; under mandible somewhat inflated at the sides near the gape; nostrils basal, horizontal, placed near the culmen. Wings large, pointed, the 3rd and 4th quills the longest, the 1st considerably shorter than the 2nd. Tail short. Legs lengthened, much of the tibia bare; tarsus reticulate. Toes long, web joining the anterior ones well developed; nails very short.

Of large size. Head nude in the adult; under tail-coverts lengthened.

TANTALUS LEUCOCEPHALUS.

(THE PELICAN-IBIS.)

Tantalus leucocephalus, Forst. Ind. Zool. p. 20 (1781); Blyth, Cat. B. Mus. A. S. B. p. 275 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Jerdon, B. of Ind. iii. p. 761 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 626 (1875); id. Str. Feath. 1879, p. 114 (List B. of Ind.); David & Oustalet, Ois. de la Chine, p. 452 (1877).

Der weissköpfige Ibis, Forster; *Stork* of Europeans in Ceylon; *Brand-Gans*, lit. "Fire-Goose," Dutch in Ceylon. *Dokh*, *Jaunghal*, Hind.; *Janghir*, Bengal.; *Lamjang*, Sindh; *Yerri Kali-konga*, Telugu; *Singa nareh*, Tamils in India; *Changa vella nary*, Tamils in Ceylon (*nary* being the name for Stork).

Datuduwa, lit. "Sickle-bill," Sinhalese.

Adult female (Ceylon). Length 40.0 inches; wing 21.0; tail 6.5; bare tibia 7.5; tarsus 7.75; middle toe 4.0, claw scarcely projecting beyond it; hind toe 1.7; bill to gape 8.2, at front from forehead 9.0.—*Female* (Sambhur). Length 38.0 inches; wing 19.5, expanse 69.75; tail 6.2; tarsus 9.2; middle toe and claw 4.7 (?); bill from gape 9.2 (*Adam*).—*Male* (Furreedpore). Length 41.8 inches; wing 20.0; tail 6.25; tarsus 8.1; bill from gape 10.08 (*Cripps*).

Iris yellowish grey, mottled with brown; bill red; naked skin of head, throat, and face orange; legs and feet fleshy red. Mr. Cripps states the iris to be "light brown," and Mr. Adam "pale brown."

Head, face, and upper part of throat bare, the naked skin extending back as far as the nape and beyond the face to the ear-coverts, passing down the throat to a point about 4 inches from the chin. Plumage glossy white, with the exception of the tail, primaries, secondaries, underlying tertials, and scapulars, and all but the greater wing-coverts, the entire under wing, axillaries, centre of the flanks, and a broad band across the breast, which are glossy black, illumined with green; the entire wing-coverts above and beneath and the flanks and breast-band with broad satiny white margins; the greater wing-coverts tinged with rosy, as also the lower back and upper tail-coverts; terminal portion of the tertials fine rosy red, the barbs open, and the extreme tips satiny white; the under tail-coverts, which have the basal parts of the webs decomposed, and the barbs furnished with a supplementary web, reach $1\frac{1}{2}$ inch beyond the tail and are faintly tinged with rosy.

Obs. Some examples are without the black band across the chest. One in the British Museum measures wing 19.5 inches, tarsus 8.5, bill to gape 9.9, and has the breast and all the wing-coverts and longest tertials completely white. This plumage is apparently that of a fully-aged bird. Another (wing 21.5 inches, tarsus 4.5, bill to gape 10.0) is identical with a Ceylonese specimen.

Young (bird reared from the nest). Bill first of all black when the nestling is unfledged, and at about a month old with a greenish tip, a few weeks after which the green advances up the bill and the tip at the same time becomes yellowish; iris brown; legs and feet flesh-colour.

The *nestling* is covered with brownish down at first; and when fledged the head and throat are covered with feathers, which, together with those of the neck, are brown; the back and wing-coverts fine slate-grey, the latter with whitish borders, and the tertials tinged with reddish from the very first.

At six months, in a caged example, the iris was hazel; bill dusky greenish, with about the terminal half yellow, which colour rapidly encroached on the green; tarsi and feet fleshy reddish.

Head and neck neutral brown, the feathers tipped pale, gradually paling into grey on the lower neck, interscapular region, scapulars, and back; the scapulars and wing-coverts dark on their inner webs and towards the bases of the feathers; lesser wing-coverts and under wing dark iron-grey, margined pale (these feathers had been entirely grey a short time previous, the centres first of all becoming dark, and that colour spreading over the feathers to the edges); tertials silvery grey, with black shafts and dark bases, the outer webs overcast with rose-colour; quills

and tail-feathers black, with a strong greenish lustre; breast greyish, paling into white on the lower parts; under and upper tail-coverts white; under wing-coverts along the edge of the wing tipped with reddish white.

The adult plumage is apparently put on at the next moult.

Distribution.—This fine bird, a giant among Ibises, is tolerably common in many parts of the northern half of the island, and is decidedly numerous on the south-east coast from the southern parts of the Batticaloa district down to Hambantota. I met with large flocks in the Magam Pattuwa near Tissa Maha Rama; and Mr. Bligh saw great numbers in the Yāla district in the early part of last year. It collects in large numbers at Kanthelai and Minery tanks during the south-west monsoon, and is, I understand, common in the Mullaitivu district and at Padewiya tank. In the immediate neighbourhood of Trineomalie I rarely saw it. It is not uncommon in the direction of Puttalam, and, I apprehend, breeds at Nikaweratiya tank. It is not found on the west coast south of Chilaw, nor does it extend westward of Tangalla, except perhaps as a straggler.

In India the Pelican-Ibis is very abundant in some parts of the empire. It appears to be particularly common in portions of the Deccan (Ahmednagar, &c.), where it breeds in large numbers in the middle of certain villages; in other districts of this region, however, it is only sparingly distributed. In Chota Nagpur it is rare; Mr. Ball procured it on the Koel river, and records it from Lohardugga, Raipur, Jaipur, and Bustar. Throughout Bengal and the North-west Provinces it is pretty well distributed, but appears to become rarer towards the north-west, although it occurs in the Sambhur-Lake district, Guzerat, Cutch, and breeds in Western Sindh on the eastern Narra. In the Punjab, according to Mr. Hume, it does not occur. Turning eastwards, we find it rare in the immediate vicinity of Calcutta; nor is it common in Furreedpore, though a rainy-season visitant. I do not find it recorded from Upper Pegu nor from the Irrawaddy delta; but in Tenasserim proper Captain Wardlaw Ramsay met with it at Tonghoo, Mr. Davison at Tavoy, Captain Beavan in large numbers at Thatone creek; and elsewhere it has been procured on the Pakehan. It does not extend further south into the peninsula, being there replaced by the closely-allied species *T. lacteus*.

Habits.—The Pelican-Ibis frequents the edges of tanks, rivers, and salt lagoons; it is frequently seen alone and often in small parties of half a dozen or even less; now and then, however, in a favourable district on the borders of some fine tank or brackish lagoon, where there is an abundance of food, one sees a large flock assembled, which present a very handsome appearance, their glossy white plumage and red tertials showing to advantage in the glaring sun. Its great length of leg enables it to walk in deep water, where it succeeds in catching comparatively large fish, which it bolts with the greatest ease. Those who have observed it closely say that it stalks about with its bill in the water and held partially open, so as to seize its prey with the greater rapidity. Blyth has noticed it feeling about in the sand with its foot for any thing that may be moving, thrusting its leg forward for the purpose. Its flight is somewhat peculiar; it often makes a few rapid strokes of its long wings, and then sails on an immense distance with motionless pinions; at other times it proceeds forward with regular beats and at a considerable speed, its long red legs stretched out behind being very conspicuous. It soars round and round like the Shell-Ibis, mounting to a great height. It is a most voracious bird, devouring any thing that comes in its way—fish, frogs, crustacea, mollusks, reptiles, &c. The young bird which I reared, and which lived six months and died from inflammation brought on by the damp weather of the Galle district, lived on meat, lizards, &c., scraps from the kitchen, and, in fact, would eat almost any thing that was thrown to it, either cooked or raw. It roamed about my little compound, often taking up its stand near or even in the kitchen, and while young would squat down on its tarsi when hungry, flap its wings, and dart out its bill. It had a great antipathy to children and dogs, and when approached by them would become very angry, squatting in the position just mentioned, its toes extended, snapping its bill loudly, and uttering a harsh and guttural erake. Fish and large pieces of meat it bolted with surprising quickness, and after being fed would walk about with its bill wide open, as if asking for more! Fish were of course swallowed, after the manner of Cormorants and Pelicans, with the head foremost. It stood much on one leg, and when resting would always squat down on the tarsus. When it grew up I confined it in an aviary with a Sea-Eagle; and as an instance of its voracity I may mention that one day I was taking a large rat in to the Eagle, and having to squeeze myself through a small doorway had passed in the hand holding the rat before I got through myself, when the Ibis catching sight of the dainty morsel ran forward, seized it, and

swallowed it head foremost before I could get into the aviary! Mr. Cripps writes of a pair he kept that "when being fed they would clatter the mandibles, shaking the head from side to side all the while, and uttering a hoarse croaking noise." At nights they roosted on the roof of a storehouse, and in a storm steadied themselves with their wings half open and their heads pointing to windward.

Nidification.—The only breeding-place of this Ibis which I visited in Ceylon was the colony at Uduwila tank. There, among the numerous species nesting at the time of my visit, were about a dozen pairs of the Pelican-Ibis. The nests were placed on the same thorny trees as those of the Pelicans and Shell-Ibises, and were large structures of sticks, some of them about 2 feet in diameter; the interior was almost flat and lined with smaller twigs; they were placed on horizontal boughs, or at the tops of others, in which case the small branches were bent down to form a foundation for the nests. The young, which were all hatched, climbed adroitly along the branches to escape being caught. There were three in almost every nest.

In India this bird is partial to banyan- and tamarind-trees, and sometimes nests in large numbers in the centre of a village, as many as twenty nests being placed on one tree. Burgess, who gives an account of a building-place in the Deccan, describes the trees, both outside and inside the walls of the village, as thickly covered with nests; the old birds moved off at early dawn to catch fish for their young, and returned about 9 or 10 o'clock; and such quantities of fish were brought by the birds that the people of the village ate large numbers which dropped from the nests. Mr. Hume observed that the young in the nests of a colony which he visited squatted down to be fed by their parents, although they stood bolt upright until the old birds arrived at the nests. The number of eggs laid varies from two to eight; but the normal numbers are three or four. They are devoid of gloss; some are pyriform, others almost perfect ovals, of a dull white colour, occasionally with a few dingy brown spots and streaks. They vary in length from 2·58 to 2·95 inches, and in breadth from 1·75 to 1·98 (*Hume*).

Genus ANASTOMUS.

Bill moderately long and straight, of a solid but fibrous structure, deep, laterally compressed; the culmen curved, the base descending to the forehead; gonys much curved; nostrils oval, wide, and horizontal, placed near the base. Wings and tail as in the last genus. Legs and toes somewhat more slender than in *Tantalus*; the webs smaller, and the membrane at the sides of the toes less developed.

Bill acquiring a worn space with age, the result of attrition.

ANASTOMUS OSCITANS.

(THE SHELL-IBIS.)

Ardea oscitans, Bodd. Tabl. Pl. Enl. p. 55 (1783).

Anastomus oscitans (Bodd.), Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Jerdon, B. of Ind. iii. p. 765 (1864); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1874, p. 31, et 1875, p. 404; Hume, Nests and Eggs, iii. p. 630 (1875); id. Str. Feath. 1879, p. 114 (List of Ind. B.); Bingham, Str. Feath. 1876, p. 212.

Le bec ouvert, Buff. Pl. Enl. 932; *Shell-eater*, sportsmen in India. *Gunpla*, *Ghongal*, *Dokar* (Behar), Hind.; *Tonte bhanga*, Bengal.; *Kha-yoo-tsoot*, Arrakan (Blyth); *Gulu kongu*, Telugu; *Natte-kuti-nareh*, Tamils in India: all these names having references to shells (Jerdon); *Karunary*, Tamils in Ceylon.

Gombelle-koka, lit. "Snail-Koka," Sinhalese.

Adult male and female (Ceylon). Length 31.0 to 32.5 inches; wing 16.0 to 17.0, expanse 59.0; tail 6.0 to 7.0; tarsus 6.0 to 6.3; bare tibia 4.5; middle toe 3.4 to 3.6, claw 0.5; hind toe 1.4; bill to gape 6.0 to 6.1, along culmen 6.5; space in anterior portion of bill 0.4 in height, extending 3.0 from tip towards gape.—*Male* (Fur-reedpore). Wing 16.75, expanse 59.50; tail 7.5; tarsus 6.25; bill from gape 0.4, at front 6.3 (*Cripps*).

Iris grey; bill reddish, patched on the sides with olivaceous; in some grey, reddish at the base and along the culmen; loreal skin dull blue; bare skin at base of lower mandible greenish leaden; legs and feet fleshy pink or reddish mingled with yellowish. The iris appears to be brown in some, according to Indian observers; but I have always found it grey.

Breeding-plumage (Ceylon). Head, neck, back, rump, and wing-coverts greyish white, paling on the underparts into pure white; interscapular region and upper scapulars tinged with grey; longer scapulars, tertials, quills, primary-coverts, winglet, and tail black, with purplish and green reflections; occiput faintly tinged with rosy; axillaries and under wing-coverts pure white.

This plumage I take to be worn only by fully adult birds. During the breeding-season in the south-east of Ceylon I have shot specimens in the so-called *winter plumage*, which consists in the white portions being sullied with leaden grey, darkest on the occiput and interscapular region. This dress, I apprehend, is worn by birds not fully adult while breeding.

Young nestling. Iris brown; bill dark green; naked skin about the chin and base of the bill and the orbits greenish black; legs brown, tinged with pinky red. Bill 3.2 to 3.4 inches from gape. (*Bingham*.)

Plumage "light grey, a little darker on the head and neck, where the feathers are short and the webs hair-like; the upper back, winglet, primaries, secondaries, tertials, scapulars, and tail black, shot with green and purple reflections." (*Bingham*.)

Immature, about six months old (Ceylon). Bill to gape 4.6 inches; tarsus 5.5. No worn space in the mandibles. Bill dark leaden; head, neck, underparts, and wing-coverts grey, the head and nape washed with brown, the interscapular region and back brown; scapulars brownish black; quills, tertials, and tail black, the secondaries with a purple and green lustre.

Obs. There is never any trace of the worn space in the mandibles when the bird is young, and, according to Lieut. Bingham, it is not until the bird is 4 or 5 months old that the space begins to show itself.

Another species (*Anastomus lamelligerus*) inhabits Africa, and is remarkable for the singular lamellated structure of the feathers of the chest and belly. The plumage is black, illumined with green and purple; chest dark brown. "Wing 14.75 to 16 inches; tarsus 4.75 to 5.84; bill at front 6.15 to 6.84." (*Heuglin*.)

Distribution.—This is the most widely distributed species of its family in Ceylon, for besides being found in the extreme north, here and there throughout the northern forests, in various localities on the eastern side of the island, and abundantly frequenting the south-east of the island, it inhabits the extreme south from Matara round to Amblangoda on the west, and further has been shot as a straggler near Colombo. It is numerous in the Hambantota and Yāla districts, inhabiting, however, the sea-board more than the interior; thence northward it is found round the skirts of the Park country to Batticaloa, but is not so common there as in the first-named parts. Large flocks are seen sometimes at Kanthelai, and in common with other Ibises it frequents the great Padewiya and other suitable tanks in the Vanni. It is plentiful in parts of the North-western Province. In 1872 a young bird was shot on the Kelaniganga not far from Mutwal; and there is a permanent colony on the Amblangoda Lake, a portion of the shores of which are flat and shallow, furnishing a supply of suitable shell-fish; but I have never seen it at the Bolgodde Lake, as it is unsuited to the bird's habits. Layard discovered a breeding-colony near Matara.

In parts of India it is very abundant where there are large rivers, tanks, and marshes, particularly in Bengal, according to Jerdon and more recent observers. It collects in the Doab in large numbers to breed. In Jodhpoor it is not uncommon, though it is not evenly distributed throughout the province; and further east, in Sindh, Cutch, and Kattiawar, it has not been noticed, although it occurs sparingly on tanks and rivers in Guzerat. In the Deccan it is not uncommon, and, according to Davidson and Wenden, is resident in the Bhima. Jerdon makes no mention of its occurrence on the Malabar coast; but in all probability it frequents suitable localities there and in the Carnatic. Turning northward again we find it pretty common in Chota Nagpur, being found sometimes on the beds of large rivers in hilly districts even. Mr. Ball cites it as occurring in the Rajmehal hills, Manbhum, Lohardugga, Singhbhum, Sirguja, Sambalpur, Orissa, Nowagarh, Karial, Jaipur, and Bustar, while Mr. Hume has had it sent him from Raipur. In the Furrceedpore district of Eastern Bengal it is pretty common from March until September, and in Sylhet it is to be met with in the cold weather (*Cripps*). It appears to extend to the eastward of the Bay in very limited numbers. It is rare in Pegu, according to Mr. Oates, and further south it is not found at all in Tenasserim. The southern portion of Burmah would appear, therefore, to be its furthest limit in this direction; and in the islands of the Bay, which are destitute of all of the Platacidæ, it is of course not found.

Habits.—This singular bird affects the borders of salt lakes, lagoons, marshes, tanks, and estuaries in Ceylon; but in India is also found along the margins of large rivers, and smaller streams even, flowing through hilly districts. In our island the maritime regions furnish it with localities suitable to its tastes, and it is there that it is mostly found. Out of the breeding-season it associates in small parties, but while nesting sallies out to feed in large flocks. I once came upon a flock of more than 100 on some grass-land round the margins of Sitrawella tank, and they presented a fine appearance as they stalked slowly about or stood erect attentively regarding me as I issued from the surrounding forest into the open. They were not particularly shy, allowing me to get within a long shot of them before rising. Though not swift on the wing, the Shell-Ibis is a bird of powerful flight, and delights in soaring in the air at a great height, after the manner of Sea-Gulls; when disturbed at their nesting-place they mount with a gyrating flight, and commence flying in wide circles, some in the opposite direction to others. It is a most inveterate consumer of shell-fish, searching about with its bill and sometimes with its feet in the mud for its prey, which, when found, it takes to a convenient spot and, holding it under one foot, breaks in the shell with a blow of its powerful bill and pulls out the contents. Smaller shells are, writes Lieut. Bingham, who has devoted much attention to its habits, crushed between its powerful mandibles and swallowed by repeated jerks of its head. It is probably owing to this habit, he remarks, that the attrition of the mandibles is caused; and such perhaps is the case; but if so, it is singular that the space does not exist at the point of greatest power, namely near the gape, where one would suppose the bird to seize the shell it desired to crush. Furthermore, although the edges of the under mandible have the appearance of being worn away by friction, those of the upper present a sort of hard leathery-looking appearance, not indicative of being caused by great pressure. The Shell-eater perches and roosts on trees, generally flying up to the topmost branch. The neck is carried almost straight, both in walking and when the bird is at rest.

The following interesting paragraph, appertaining to the habits of this species in confinement, is contained

in Jerdon's 'Birds of India':—"Many years ago several Shell-eaters were brought to me alive for the purpose of training Bhyri, and these, as is usual, to prevent them struggling or fluttering, had their eyes sewn up. To feed them the falconer had a quantity of the large *Ampullaria* brought, which were placed before the captive and blind Shell-eaters. The bird secured a shell by its feet and after sundry alterations of its position succeeded in cutting off the operculum as clearly as if it had been done by a razor, but so rapidly that I was unable to see the exact way in which it was accomplished. It then inserted the tip of its clumsy beak into the open mouth of the shell, and after working it about for a short time pulled out the entire shellfish almost to its utmost tip. I saw this process repeated many times, and I cannot conceive that a bird which takes the trouble to extract the animal from the comparatively brittle *Ampullaria* should require to bruise the more hard and solid shell of the *Unio*." Although shellfish form the main food of the Shell-Ibis, as all its native names testify, it will eat frogs and fish, but will not live long in confinement, writes Lieut. Bingham, if kept long on an exclusively fish diet. This writer also says that at night they utter a curious laughing chattering noise, with frequent clatterings of the bill. These birds are caught, according to an informant of Dr. Jerdon, by means of a bamboo with a noose attached, which is bent down and fixed lightly in the ground by a small peg, to which an *Ampullaria* is fixed. "The Shell-eater hunting about finds the shell, and moving it to get at its contents the peg is withdrawn, the bamboo flies up, and the noose catches the bird, which remains dangling in mid air."

Nidification.—The Shell-Ibis breeds in the south of Ceylon in January, February, and March. I found them nesting in considerable numbers at Uduwila tank; but at the time of my visit the young were all hatched and some of them well grown. The nests were large flat structures of sticks, the egg-platforms being lined with small twigs and roots; they were placed in the same trees with the nests of the last species. The old birds flew up into the air, mounted to a great height, circling round and round like Herring-Gulls, and frequently descended from a great altitude with a terrific rush and booming noise of the wing until they almost touched the trees, from which the momentum of their heavy bodies enabled them to mount again in the same swoop. Beyond this they showed no sign of defending their nests. Layard refers to the assertion of the natives that these birds "defended their nests with such pertinacity that they feared to mount to them." This of course was nothing more than the common excuse made by the country people on all such occasions.

In India this species breeds in July and August, great numbers repairing to the Central Ganges, Doab, for this purpose. They build on lofty Peepul- and Neem-trees, on which occasionally as many as sixty-two nests may be seen. They are repaired year after year, and are circular platforms about 20 inches in diameter, with a shallow depression in the centre, which is sometimes lined with tufts of grass or a few leaves. The eggs vary in number from 2 to 5, and are at first pure white, becoming afterwards stained to a deep yellowish-brown colour; they are oval in shape, the average size of two specimens being 2.2 inches in length by 1.49 in breadth (*Bingham*). A large series vary, according to Mr. Hume, from 2.0 to 2.52 inches in length, and from 1.48 to 1.82 in breadth.

Genus IBIS*.

Bill long, curved throughout, slender at the tip, high and wide at the base, the sides perpendicular and suddenly compressed to about the middle; culmen rounded at the tip and elevated above the naral groove at the base; sides of the forehead higher than the centre; naral groove running parallel to the culmen and extending to the tip; nostrils linear, placed in a horizontal membrane. Wings with the 2nd quill the longest; tertials equal in length to the primaries. Tarsus reticulate. Toes stout, bordered by a narrow membrane.

Head bare in the adult. Tertials lengthened and decomposed, and the pectoral feathers elongated in the breeding-season.

IBIS MELANOCEPHALA.

(THE BLACK-HEADED WHITE IBIS.)

Tantalus melanocephalus, Lath. Ind. Orn. p. 709 (1790).

Ibis melanocephala (Lath.), Vieill. Nouv. Dict. Hist. Nat. xvi. p. 23 (1817); Elliot, P. Z. S. 1877, p. 488; Salvadori, Uccelli di Borneo, p. 359 (1874); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.).

Threskiornis melanocephalus (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 275 (1849); Jerdon, B. of Ind. iii. p. 768 (1864); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 632 (1875).

Black-headed Ibis, Lath.; *White Ibis*, *White Curlew*, Indian sportsmen. *Munda*, Hind., also *Sufeid buza* and *Kachia tori* (Purneah); *Sabut buza*, Bengal.

Tattu-koka, lit. "Bald Koka," Sinhalese.

Adult male (Ceylon). Length 29.0 inches; wing 14.5; tail 5.0; tarsus 4.25; bare tibia 2.5; middle toe 3.2, claw (straight) 0.7; hind toe 1.2; bill to gape (straight) 5.4, height at gape 1.2, width across hollow at base of culmen 0.85.—*Male*. (Sambhur Lake) Length 30.9 inches; wing 15.3, expanse 53.3; tail 5.1; tarsus 4.3; bill at front along curve 6.2 (*Adam*). (India: Brit. Mus.) Wing 13.5 inches, bill to gape (straight) 4.7.

Iris brown, "blood-red in some" (*Jerdon*); bill black; legs and feet black or blackish purple; bare skin beneath the ulna red.

Breeding-plumage (India: Brit. Mus.). Head and neck bare, the skin black, extending down the hind neck 4 inches from the occiput, and on the fore neck 5 inches from the chin. Plumage white, the scapulars and tertials decomposed or with open barbs, lengthened and tinged with dark grey near the tips; plumes at the lower part of the fore neck lengthened.

Apparently it is only old birds which have the quills pure white; generally the shafts are black with a portion of the tips of the feathers. Mr. Adam instances one with a "narrow black line, about an inch in length, on only one of the quills." In some examples the bare skin at the back of the neck is crossed by red bars; and other specimens have the tertials pure white.

* The members of the group to which this genus belongs form the subfamily Iridinæ of some authors. The present and the following species are the sole representatives of this subfamily in Ceylon.

In *winter* the scapulars and tertials are not decomposed and the breast-plumes are absent.

Young, immature (March, Ceylon). Iris brown; bill black; legs and feet black.

Neck and head feathered nearly to the anterior corner of the eye and in a point to the base of the culmen; plumage of the head and face, passing back from the lower edge of the under mandible onto the back of the neck for about 4 or 5 inches, black; the throat and all the rest of the neck and plumage white; shafts of the quills and tertial feathers black, the terminal portions of the webs of the latter blackish grey; outer webs of the first two primaries and the edge of the terminal portion of the first three blackish grey. The scapulars and tertials are not lengthened, and the breast-plumes are absent. At the first moult the feathers of the head and neck are said to become white, and in the following year are shed altogether and the skin left bare. I am under the impression that birds breed in this immature plumage, as I found them in such at a breeding-colony in the south of Ceylon.

Obs. This Ibis is closely allied to the Sacred Ibis of Egypt, *I. æthiopica*, Lath., which differs from it in having the tips of the primaries in the adult greenish black, the tertials more lengthened and blacker at the tips. In Africa this bird extends as far south as the Transvaal, and is united by Mr. Elliot with Gould's Australian species, *I. strictipennis*, which was separated by the latter author on account of the lengthened feathers of the lower part of the throat; but this appears to be a character of the African bird in the breeding-season. It is singular, however, that this species is not found in Asia, particularly in India, if it is identical with the Australian bird. The wing-measurement of *I. æthiopica* is 14 inches, bill along culmen varying from 5 to 8 inches.

Distribution.—The White Ibis is found here and there throughout the northern forests in the vicinity of large tanks, and extends down the east coast to the Hambantota district, probably not passing much to the westward of the Wallaway river. About Yāla it is rather numerous. It is rare in the Trincomalie district, although it is said to be not uncommon about Mullaittivu. It is pretty common in the North-western Province, and breeds as far south as the tank at Nikaweratiya; but I imagine that it does not extend down the west coast further than Chilaw. Mr. Holdsworth has seen it near Aripu, and it is also found at Manaar sometimes, and northward along the coast to Jaffna.

According to Jerdon it is not uncommon in many parts of India, and it is apparently as numerous, if not more so, in Sindh and the surrounding provinces as anywhere else, parts of Jodhpoor being perhaps an exception, as I observe that Mr. Adam only once met with it at the Sambhur Lake. It is common in the Doab, and is distributed throughout Chota Nagpur, but nowhere abundant, localities cited in this district being Manbhum, Lohardugga, Sirguja, Sambalpur, Orissa, Nowagarh, Karial, Jaipur, Bustar, and Raipur. In the Deccan it is not rare, and has been observed in that part by Mr. Davidson from October till about July, most probably breeding there. Looking eastward, I find it tolerably numerous, according to Mr. Oates, on plains intersected by the tidal creeks of Burmah; and in Tenasserim it is not uncommon in similar localities of the central portion of the province. In the peninsula of Malacca it is probably found, though I do not find any record of its occurrence there; but Schlegel notes it from Java: I apprehend also that Temminck's Sumatran Ibis belongs to this species; and it is doubtfully recorded from Borneo by Salvadori. In the Moluccas, according to Elliot, the Australian and African species reappears, and extends along the east coast of Australia as far south (as a straggler) as Victoria. It is, however, probable that owing to its isolated geographical range the Australian species is after all distinct from the African. Careful investigation will no doubt bring some characters to light (difference in size perhaps, or the constant presence of the red bars on the hind neck, or peculiarities in habits) which will serve to establish Gould's determination beyond dispute. Finally, our bird is found in the summer in China, and probably extends, according to David and Oustalet, as far north as the marshes of Mantchouria.

Habits.—This fine Ibis associates in flocks during the non-breeding season. In Ceylon, however, where it is not very abundant, it goes about in small parties of ten or a dozen, frequenting the borders of large tanks and wet grass-bunds near estuaries of rivers and tidal creeks; occasionally, however, large flocks are seen in the North-western Province and on the south-east coast. In India it is found, says Jerdon, on the banks of rivers, about tanks, marshes, and paddy-fields, feeding on mollusks, crustacea, insects, worms, &c., "in search of which it moves its bill about in the water." It is a shy bird, difficult to approach when feeding, and when nesting is more wary than any other birds breeding with it, except perhaps the Spoonbill, flying off

at once, and keeping well out of range as it careers round and round the tank. When it gets on the wing at first it flies with very rapid strokes, making a whizzing noise; but when well up in the air it settles down at a steady pace into a straight-on-end flight.

Nidification.—Several pairs of these Ibises were frequenting the breeding-place already noticed at Uduwila tank near Tissa Maha Rama; but their nests were on trees growing in the water, and inaccessible, and consequently I was unable to procure their eggs or young. The time of my visit was the 25th of March; and as most birds then had young, I conclude the same was the case with the present species, so that the time of commencing to breed in that part of the island would be about the end of January. In the North-western Province it commences earlier. Mr. Parker writes me, concerning a large breeding-colony which he visited in December 1878, that this species had young on the 31st of that month. I append the following extract of his account of his visit to the colony:—"Having received intimation that some men had discovered a breeding-place of the Waders of the district (one of those places crowded with nests and birds, of which one so often reads an account), I determined on visiting it. It was only half a mile away and we were soon there. It was at the high side of the Nikaweratiya tank, and a great mass of thorny trees effectually concealed it. We crawled under these for some distance, and then began to enter the water of the tank. As this slowly became deeper we emerged into an open space of three or four acres interspersed with a few partly-submerged bushes and trees. On all these were crowds of birds; White Ibises by dozens were close to us on the right, and many White Storks (? *Tantalus leucocephalus*) on the left, while Lesser Cormorants and Lesser Egrets seemed to occupy all the remaining space in the trees. Under one of these was a large crocodile on the look-out for any stray youngsters that might be unwary enough to fall into the water. Overhead circled a fine White-tailed Eagle, a few Kites, and, far above all, two Darters, looking like gnats in the clear blue. Then what a cawing and squawking and screaming there was when we were seen! Birds seemed mixed up in hopeless confusion; but eventually most of them settled down on trees near at hand. In about ten trees or bushes, most of them not more than 15 or 20 feet high, were crowds of nests—unshapely masses of sticks, on many of which might be seen young birds sitting or walking about. In the trees on our right, frequented by the Ibises, the nests were laid along some of the branches so closely that the young simply stepped from one nest into the next at pleasure, and the whole seemed to be common property. On one branch the centres of the nests (mere slight depressions in the beds of sticks) could not have been more than 18 inches apart. It was far from an easy matter to catch the young Ibises. They climbed about almost like Parrots, hooking their bills onto branches, or even taking hold with them, and thus drawing themselves up, whilst their little black legs kicked about in the air as they wriggled their necks further over, and presented a most ridiculous appearance.

"Without exception the nests of these birds contained three eggs or three young ones, and I presume these are the invariable number. The ages in different nests varied from fresh eggs to the almost full-grown young; and I should consider that the breeding lasts from the middle of November until the middle of February." Two eggs sent me by Mr. Parker are dull white and somewhat rough in texture; in shape they are elongated ovals, slightly broader at one end than the other, and measure 2·7 by 1·7 and 2·45 by 1·6 inches respectively. The majority of specimens, writes Mr. Hume, are free from spots; but some are delicately marked with reddish brown; and of this sort Layard procured specimens in Ceylon, as he describes the eggs as chalky white, sparingly blotched here and there with dry blood-coloured marks, thickest at the obtuse end. Indian eggs vary from 2·1 to 2·82 inches in length, and from 1·5 to 1·82 in breadth (*Hume*).

Genus PLEGADIS.

Bill much slenderer than in the last, and far less stout at the base; nostrils placed nearer the base. Wing with 1st primary nearly as long as the 2nd, which is the longest. Legs longer than in *Ibis*, slenderer. Tarsus covered in front with broad transverse scales, reticulate behind. Toes long and slender.

Head and neck feathered; the anterior portion of the face nude.

PLEGADIS FALCINELLUS.

(THE GLOSSY IBIS.)

Tantalus falcinellus, Linn. Syst. Nat. i. p. 241 (1766).

Numenius igneus, S. G. Gmel. Reise d. Russl. i. p. 166 (1770).

Plegadis (Ibis falcinellus, L.), Kaup, Natürl. Syst. p. 82 (1829).

Falcinellus igneus (Gmel.), Gould, B. of Austr. vi. pl. 47 (1848); Blyth, Cat. B. Mus. A. S. B. p. 274 (1849); Jerdon, B. of Ind. iii. p. 770 (1864); Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 404; Salvadori, Ucc. di Born. p. 360 (1874); Elliot, P. Z. S. 1877, p. 503; Hume, Nests and Eggs, iii. p. 635 (1875), et Str. Feath. 1879 (List Ind. B.), p. 114.

Ibis falcinellus (Temm.), *apud* Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Heuglin, Ois. N. Ost-Afr. ii. p. 1132 (1873); David & Oust. Ois. de la Chine, p. 433 (1877).

Plegadis falcinellus (Linn.), Dresser, B. of Eur. pt. 71, 72 (1878).

Courlis vert, Buff.; *Bay-green and Glossy Ibis*, Lath.; *Black Curlew* of Europeans. *Herez*, Arabic (Heuglin); *Swartz-whelp*, lit. "Black Curlew," Dutch; *Prater whelp*, Portuguese in Ceylon; *Kewari*, Hind.; *Kowar* in Purneah; *Tati kankaram*, Telugu; *Karapu kotan*, lit. "Black Snipe," Ceylonese Tamils.

Rattu-datuduwa, lit. "Black Sickle-bill," Sinhalese.

Adult female (Ceylon). Length 24·75 inches; wing 11·5; tail 4·0; tarsus 4·5; bare tibia 2·0; middle toe 1·6, its claw (straight) 0·7; hind toe 1·0; bill to gape (straight) 5·6.—*Adults*. (Greece, Brit. Mus.) Wing 10·4 to 11·75; tarsus 3·8 to 4·3; bill to gape 4·5 to 5·2. (India) Length 22·0; wing 10·75; tarsus 4·0; bill at front 6·0 (Jerdon). Mr. Elliot's measurements (*loc. cit.*) are:—Length 25·0; wing 12·0; tail 4·75; tarsus 4·25; bill along culmen 6·0. Males are the larger of the sexes; but apparently considerable individual difference in size exists.

Iris brown, in some mottled with grey; bill dark livid brown; facial skin livid, extending round the eye from the centre of the forehead and thence to the sides of the lower mandible; legs and feet bronzed brown, bluish above the knee.

Female (Ceylon). Head and cheeks metallic green, with purplish-bronze reflections; entire neck and upper part of interscapular region, as also the under surface to the vent, maroon-red; least wing-coverts and upper scapulars shining maroon-red; back, upper tail-coverts, scapulars, and wing-coverts brilliantly glossed with amethystine or purple-bronze colour, the green being most vivid on the rump and outer wing-coverts; tail green-brown, glossed with amethystine; primary-coverts, primaries, and secondaries dark green, with bluish reflections; under tail-coverts dusky green, glossed with purple; axillaries brownish green, glossed with purple; under wing dark glossy green.

Young, nestling in down. "Covered with rather short, close, black down, with a broad white band over the crown; legs and bill yellowish, the latter black at the base and tip, and with a central black band." (*Dresser.*)

Nestling plumaged, but unable to fly (Ceylon). Bill dusky, with two bands of reddish white, one near the base and the other at the middle. Plumage entirely brown, with a faint lustre on the wings; no band over the crown.

Immature (Celebes). Tarsus 3·7 inches; bill to gape 5·0. Head and neck unglossed brown; the feathers with white terminal edges, imparting a striated appearance; back and wings brownish black, glossed with green; under surface earthy brown.

Obs. It is noteworthy that there are three closely allied species of Glossy Ibis in America, differing chiefly from the present bird in not having green heads, this part of the plumage, together with the neck, being purplish chestnut in two and dark rufous-brown in another. They are:—*P. guarana*, Linn., *Hab.* Chili and Buenos Ayres; *P. ridwayi*, Allen, *Hab.* Lake Titicaca; *P. thalassinus*, Ridgway, *Hab.* California to Chili.

With regard to the name employed for this Ibis, I have followed Mr. Dresser in adopting a genus of Kaup's, which is the oldest applicable to the species. The generic name of *Falcinellus* appears never to have been applied to this bird by the older authors; and if it had been it could not be made use of, as this title is the oldest specific one, and should be used therefore in that sense.

Distribution.—This species, like the other members of its family, is an inhabitant of the tank-districts of the island, but is also found sometimes in tolerable abundance in the extreme north. It is well known to the Dutch and Portuguese inhabitants of Jaffna, for it is frequently seen on the tidal flats near the town and at the mouth of the Lake. It frequents the shores of many of the larger tanks, such as Minery, Kanthelai, and other similar sheets of water, and in the breeding-season withdraws to more secluded localities. On the eastern side of the island, as well as in the north and north-west, it affects the shores of salt lagoons and extensive estuaries, and in the Hambantota district is found about the leways, as also in the vicinity of jungle-begirt tanks. In the North-western Province it is met with here and there, but, as elsewhere, not numerous, owing to the fact of its being merely a resident species, and not one whose numbers are augmented by migratory flocks in the cold season from India. What migrants do come to Ceylon probably scatter themselves round the north coast as far as Mullaitivu on the east, and perhaps Puttalam on the west.

In India it is an abundant bird in some parts during the cold season, but does not seem to breed anywhere but in Sindh, in which province, as well as in the circumjacent parts of the country, it is very numerous about inland waters. The Sambhur-Lake district, however, is an exception, as Mr. Adam has not met with it there. In the Peninsula it does not appear to be at all common, as I observe that Messrs. Davidson and Wenden record the occurrence of but one specimen in the Deccan, and that Mr. Fairbank did not meet with it at all. In Chota Nagpur it is rare, occurring nowhere commonly except in Rajmehal near the Ganges. About Calcutta it is only occasionally seen, and in Furreedpore is met with in small parties in the rains. Further east it is recorded from Pegu by Messrs. Oates and Feilden, but does not appear to be a regular visitor. In Tenasserim it has not been noticed, nor is it mentioned in Mr. Hume's list of the birds of the Malay peninsula. To the east, however, it occurs in Cochin Chin, and is also found, according to Swinhoe, in China proper, about lakes at Ningpo and Shanghai. Père David, however, doubts the authenticity of the information on which that naturalist admitted the species into the Chinese avifauna. Turning southward I find that it is recorded from many of the Malay islands, including Sumatra, Java, Borneo, Celebes, Ceram, and New Guinea; whilst in Australia it has been found all along the northern coasts and down the eastern side of the continent to Victoria, extending thence to the colony of South Australia.

Returning to Western Asia we find it in Persia and on the Caspian, where it is common. In Palestine, however, it is rare, and also in Asia Minor. A bird of passage to Europe, it is plentiful in some of the more southern countries, and a straggler very far north, having occurred not only on the Faroes, but also in Iceland, though it has never yet been met with in Greenland. On its way north, and more frequently returning in the autumn, it has often visited England, and was formerly said to be tolerably common as a migrant in Norfolk. In Ireland it has also occurred, as also in Scotland. It is a straggler to Norway, Sweden, and Finland, and visits in the same manner parts of Germany and Poland; whilst in Eastern Siberia it is not at

all rare. It has been met with, according to Collin, on several occasions in Denmark. In the western countries of Europe it is equally an accidental visitor, having been rarely seen in Holland, Belgium, and France; further south it becomes common. Mr. Saunders says that it is abundant in the marismas of Southern Spain, and Professor Boeage records it as common in Portugal. Col. Irby saw great flocks at the lakes of Ras Dowra at the end of April, and met with them in Andalucia, and says that they breed near Vejer and in the marismas of the Guadalquivir. Near Gibraltar he only noticed it in April and May on passage north; he has seen eggs from Morocco, and quotes Favier to the effect that the bird occurs in Tangier on passage, returning to pass the winter further north; but some remain to breed, occurring in May, June, and July. In May it was seen in flocks in the Balearic Islands by Von Homeyer. Mr. Brooke says it occurs "not uncommonly" in Sardinia during winter; and in Malta Mr. Wright says it is a pretty regular visitor in spring and autumn. Returning, however, to Africa, we find Canon Tristram meeting with it at Tuggurt, and Mr. Salvin at Zana to the north of the Sahara. Captain Shelley says it ranges through Egypt and Nubia, being found, but not abundantly, throughout the year. Von Heuglin met with it in pairs and flocks, both in spring and in autumn and winter, in Egypt, Nubia, Kordofan, and Abyssinia; he met with stragglers in July and August near Quenah and Keren, and saw young birds near Berber, as also old ones at the Tana Lake in Abyssinia; but, notwithstanding these instances, he is not of opinion that it is stationary in the region in question.

As regards America, Mr. Dresser writes that its range is not well defined, and quotes Dr. Coues, who mentions a specimen having been procured in 1817 near New Jersey, and writes:—"Since that time it has been found at irregular intervals along our coast, chiefly in the southern and middle districts, but occasionally as far north as Massachusetts, where, however, its occurrence must be considered as accidental." It has been obtained in Connecticut; and Mr. Dresser procured it in Texas, and at Matamoras in Mexico. He states that it is not certain how far south it extends, as it is there replaced by an allied species, *P. ridwayi*, Allen, which has the underparts dark, which has been found in Peru, Chili, and Buenos Ayres, and has been confused with the present. The present bird has, however, been seen in Cuba.

Habits.—This widely distributed Ibis is not only sociable but highly gregarious in its nature; it is seldom seen in less than flocks of half a dozen or more, and frequently in the cool season vast flocks assemble together and patrol the edges of tanks, large swamps, and tidal rivers, or overrun the muddy foreshores of shallow bays at low water. It is usually in Ceylon a very shy bird, and has been also noticed to be wary in most other parts of the world. In India, however, it is spoken of by more than one observer as the reverse of shy. Mr. Hume remarks that in Sindh "it was excessively tame, and sat on the trees and bushes overhanging the water, or fed fearlessly in amongst the rush and reeds till the boats were within 20 yards of it." Its diet is varied, consisting in marshy lands of frogs, worms, crustacea, mollusks, and various water insects; and in plains, to which it has a partiality, of beetles, scorpions, and locusts, on the latter of which, according to Von Heuglin, it exclusively feeds on the savannas of Kordofan. The Glossy Ibis is a graceful bird when walking on the ground; the body is held moderately erect, the neck inclined forward, and the tips of the bill pointed downwards. It flies with a quick motion of the wings, and when in a flock its members keep close together and progress with a straight-on-end course. I have not heard its note, but Jerdon states that it is a loud call uttered when on the wing or when alarmed.

Nidification.—In March 1872 I found a small colony of these Ibises, numbering about eight pairs, nesting at Uduwila, near Tissa Maha Rama. The nests were placed on thorny trees growing in the half-dried bed of the small tank already referred to in former articles, and the trees chosen were those on which the Shell-Ibises were nesting. The nests were small and mostly made of twigs and grass-roots, almost flat in shape and placed upon the horizontal forks of small branches high up in the trees. The young were fledged, but unable to fly, and when I approached the trees stood up in the nests, scrambling along the branches and climbing actively about them as I mounted to the nests; when seized they clung tightly with their feet, and were with difficulty removed. My efforts to keep them alive were not successful, for while several Pelicans and Pelican-Ibises thrived on fish and meat, the Glossy Ibises died, only living two days. When flying away from their nests the old birds made a whizzing sound with their wings.

This species has been recently discovered breeding in Sindh by Mr. Doig, C.E., who found their nests in trees along the banks of large lakes bordering the Narra river. He describes the nests as about the size of those of the Darter, and made of sticks on the tops of Kundy-trees. The eggs were three in number, ovals, pointed at both ends, and of a beautiful green colour, roughly pitted over with slight indentations, giving the shell a rough appearance. They varied in length from 1·8 to 2·15, and in breadth from 1·3 to 1·55 inch.

HERODIONES.

Fam. CICONIIDÆ.

Bill stout, long, and straight, the gape not angulated, and the gonys very long. Wings long and pointed. Tail short. Legs very long; tibia naked for more than the length of the middle toe; tarsus reticulate. Toes moderately long, webbed at the base, most deeply between the outer and middle toe; claws straight and short.

Of very large size. Sternum with a single notch, pointed at the apex.

Genus LEPTOPTILUS.

Bill enormous, high at the base, gradually compressed thence to the tip; culmen quite straight; gonys almost imperceptible; tip of the lower mandible gently curved upwards; nostrils linear, placed near the culmen, with a shallow groove running parallel to it towards the tip, which is notched. Wing lengthened, with the 3rd and 4th quills the longest, and the 1st considerably shorter than the 2nd; tertials lengthened. Tail even at the tip. Tibia and tarsi covered with reticulate scales.

Skull completely bare; neck devoid of feathers.

LEPTOPTILUS JAVANICUS.

(THE HAIR-CRESTED STORK.)

Ciconia javanica, Horsf. Trans. Linn. Soc. 1821, xiii. p. 188.

Leptoptilus javanica (Horsf.), Blyth, Cat. B. Mus. A. S. B. p. 277 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 732; Holdsw. P. Z. S. 1872, p. 477; Salvadori, Uccelli di Born. p. 358 (1874); David & Oustalet, Ois. de la Chine, p. 449 (1877); Hume, Str. Feath. 1878, p. 469 (B. of Tenass.), et 1879, p. 114 (List B. of Ind.); Sharpe, Ibis, 1879, p. 272.

The Javan Adjutant, The Lesser or Small Adjutant, Europeans; *Marabou Crane*, Europeans in Ceylon. *Chinjara*, Hind.; *Madan-chur, Modun-tiki*, Beng. (Jerdon); *Tontsap*, Arakan (Blyth); *Bangu* (Java); *Burong Kambing, Burong Gaja*, Sumatra (Raffles); *Hoang*, Chinese in Hainan.

Māna, Sinhalese and Tamils in Ceylon.

Adult female. (Ceylon) Length 45·0 inches; wing 24·0; tail 9·5; tibia (bare) 7·0; tarsus 9·0; middle toe 4·5, its claw (straight) 0·5; bill to gape 10·0, at front 9·8. (India) Length 48·0 inches; wing 26·0; tail 10·0 to 11·0; tarsus 9·5; middle toe 4·5; bill to gape 10·0 (Jerdon). (China) Length 42·0 inches; wing 24·0; tail 12·5; tarsus 8·6; bill at front 8·3 (David & Oustalet).

Female (Ceylon). Iris greenish white, with a brown inner circle; bill brownish grey, culmen reddish at the base; legs and feet cinereous brown; edges of scales whitish; skull, which is bare, whitish brown.

Neck devoid of feathers, the region above the ears, occiput, and nape scantily clothed with greyish down, mingled with long reddish-brown hairs, forming a crest on the nape about $4\frac{1}{2}$ inches in length; the same down and hairy covering is distributed over the neck to within an inch or so of its lower part, which portion is quite bare; entire under surface and the feathers round the lower part of the back of the neck white, some of the latter tipped with blackish; interscapular region, centre of lower back and rump (where the white of the flanks encroaches), tail, and entire wings deep glossy blackish green, the feathers of the interscapular region and wing-coverts with dark margins and cross-rays, the longer scapulars and tertials with handsome broad white margins, blending into the green; the scapulars and quills, chiefly on the outer webs, strongly glossed with purple; under tail-coverts white, the feathers long and decomposed, with the barbs curled and furnished with a fluffy supplementary appendage, which wears off to a great extent when the feathers are abraded.

Young. I have no information concerning the young of this species.

Obs. The large ally of this Stork, *L. aryal*, the celebrated Adjutant of India, is furnished with a long, pendent, and pointed pouch, in which it stores away the surplus food that it may have caught. This unsightly appendage, which adds to the ugly appearance of the bird, is from 1 foot to 15 inches in length. The upper plumage is black, tinged with ashy; the white feathers round the lower part of the neck form a conspicuous ruff; the greater coverts grey, forming a wing-band; whole head, neck, and pouch quite bare. Wing about 30 inches. This species is very abundant in Bengal and parts of Burmah.

Distribution.—The so-called “Marabou Crane” is an inhabitant of the hot and dry districts of Ceylon, being sparingly distributed throughout the northern forests from Kurunegala and Puttalam to Jaffna, and down the east side of the island to the neighbourhood of Tangalla. In the moist districts of the south and in the Western Province it is not found. I have met with it in the Trincomalee district, near Tiriyeyi (Tirrai), Tamblegam, Kanthelai, and Topoor tank. Mr. Holdsworth has seen it near Aripu; and Layard met with it at various tanks in the Vanni. Mr. Parker informs me that it is found occasionally throughout the year in the North-western Province; it is fairly common in the dry south-eastern district, where Mr. Bligh has procured specimens, and frequently met with them by the lonely water-holes which stud the thick jungle of that part of

the island. It is, however, nowhere abundant, and in the breeding-season, I imagine, retires to the wildest and most unfrequented tanks to breed. Notwithstanding, it is quite possible that its numbers are increased during the north-east monsoon by sundry arrivals from India.

In the peninsula of India it is not a very common bird. Jerdon writes of its general distribution as follows:—"This species of Adjutant is found in small numbers throughout India, frequenting marshes, inundated paddy-fields, and the edges of lakes and rivers. It prefers a wooded country; and in the south of India I have only seen it on the Malabar coast. It is rare in Central India and the Upper Provinces, is now and then found in Lower Bengal, and more common in Assam, Sylhet, and Burmah." In the Deccan Messrs. Davidson and Wenden say that it occurs during the rains about marshy tanks on the outskirts of the Nulwar jungles. In Chota Nagpur Mr. Ball has met with it in Manbhum, Sirguja, Sambalpur, Lohardugga, and Jaipur. Mr. Hume has occasionally seen it at Calcutta. I do not, however, find Mr. Cripps noticing it in his list of Furreedpore birds, nor Mr. Inglis in his Cachar list. In both Upper and Lower Pegu, however, it is common, and Jerdon, as quoted above, asserts that it inhabits Assam. Vast assemblies of both species visit Pegu to breed; and so abundant are they that Mr. Oates has counted more than two hundred in a small pool of three acres. Southward, in Tenasserim it is very sparingly distributed throughout the central and southern portions of the province, the majority being probably seasonal visitants, from October to April (*Hume*). Mr. Davison has seen them most abundantly about Moulmein and Thatone, where they breed on masses of limestone rocks. It extends probably through all the Malay peninsula, although we only know of its occurrence as yet in Malacca. It has been obtained in Sumatra, being included in Sir Stamford Raffles's list of the birds of that island; and in Java it was procured by Horsfield, and first described by him from his specimens. Salvadori records it from Sarawak, in Borneo; and recently Mr. Low has obtained it in the province of Lumbidan. Going northward now, we find it in Hainan in marshes, in the centre of which island Mr. Swinhoe met with it; Père David likewise records it from Cochin China, and met with it in Kiangse in the month of July.

Habits.—Unlike the larger Adjutant, this bird, instead of frequenting towns and villages, and performing the duties of a useful though very unsightly scavenger, shuns the society of man, and frequents jungle and forest-country, afflicting lonely marshes, tanks, swamps, banks of rivers, and even small water-holes in the depths of wild and unfrequented jungle. In Ceylon it is almost exclusively found about the latter localities and small tanks in the very remotest recesses of the northern and eastern forests. It is often seen in small parties of three or four, but more frequently is encountered singly, and when disturbed usually flies to the top of a tall tree on the outskirts of the jungle, where it remains until from its elevated position it sees that the field is clear, when it descends again to its fishing-grounds. While thus perched its neck is outstretched and head elevated, its attitude being one of watchfulness; but when standing on the ground or walking in water the neck is entirely drawn in, and the nape actually rests against the shoulders, from which position, however, the head is shot instantaneously out when it catches sight of its prey. I have observed that in a state of captivity the mandibles are scraped together with a quick lateral motion, this action being performed when the bird expects to be fed. When reposing it squats on the hind part of the tarsus, with the toes stretched out. Its diet is miscellaneous as regards animal food, and large insects, such as locusts, are also devoured by it. In the stomach of an example I shot in the Trineomalie district I found the remains of frogs, crabs, fish, and a small mammal, probably a rat. In conjunction with its larger ally and Pelicans it is said to create tremendous havoc among fish in Burmah when the tanks are drying up. This Stork, like its relation, the Pouched Adjutant, is a very silent bird; the latter during the breeding-season makes a noise like the "low of a buffalo," or a cow which has been robbed of its calf; and most probably the note of our species is similar.

Jerdon remarks that "its Bengal name *Modun-tiki* is applied to it ironically, from its ugly head and neck, the expression meaning that the hair of its head is as beautiful as Modun, one of the sons of Krishna."

Nidification.—It is somewhat noteworthy that as yet the Adjutant has not been found breeding in Ceylon. If, as Mr. Parker informs me, it is resident in the northern forests, it must needs breed somewhere, and being such a large bird it is singular that some "colony" has not been discovered. It may after all be only migratory; but against this hypothesis we must set the fact that at the time of its visiting Ceylon it is

breeding in large numbers in Burmah. In this latter country both species arrive suddenly in vast numbers in October, and commence breeding in the following month. On a range of limestone rocks called the Needong hills, which rise perpendicularly from the forests on the Attaran river, Mr. C. T. Bingham found a large colony of both species, the nests being placed on ledges of the rock, and were large flat masses of sticks without any lining. Unfortunately no eggs of the present species were procured, those taken belonging to the Pouched Adjutant. Mr. Oates has recently recorded the finding of an enormous colony of Adjutants and Pelicans extending over a large forest on the left bank of the Sittang, between Rangoon and Tonghoo. The nests were wedged into the forks of the branches of immense trees, and were so large that a sitting bird could not be seen from below. Some eggs brought to Mr. Oates by a native as those of the Hair-crested Stork were snow-white, with the interior lining of the shell dark green; but as they measured more than those of the Pouched Adjutant, it is probable that they belonged to the latter bird. The dimensions of two were 3.16 by 2.25 and 2.98 by 2.2 inches.

A pair of eggs sent by Mr. Low from Lumbidan, Bornco, together with the head of the female bird, to Mr. Sharpe, are pale greenish blue, measuring 2.7 by 1.95 inch.

Genus XENORHYNCHUS.

Bill very large; culmen and commissure slightly ascending near the tip. Legs longer than in the last genus.

Head and neck feathered closely.

XENORHYNCHUS ASIATICUS.

(THE BLACK-NECKED STORK.)

Mycteria asiatica, Lath. Ind. Orn. ii. p. 670 (1790), adult.

Ardea indica, Lath. Ind. Orn. ii. p. 701 (1790), immature.

Mycteria australis (Shaw), Gould, B. of Austr. vi. pl. 51 (1848); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 734 (1864); Holdsw. P. Z. S. 1872, p. 477.

Mycteria indica (Lath.), Hume, Nests and Eggs, iii. p. 607 (1875).

Xenorhynchus asiaticus (Lath.), Hume, Str. Feath. 1878 (B. of Tenass.), p. 469, et 1879, p. 44 (List B. of Ind.).

Indian Jabiru, Lath. Syn. Suppl. p. 231; *Loharjung Heron*, Lath. (immature); *Indian Jabiru* of some. *Banaras, Loharjung*, Hind.; *Ram salik*, Bengal (Jerdon); *Peria koku*, Ceylonese Tamils, lit. "Large Heron."

Al-koka, lit. "Man-Heron," from its size, Sinhalese (Layard).

Adult (India: B. Mus.). Wing 25·0 inches; tail 10·0; bare tibia 7·0; tarsus 11·8; middle toe 4·3; bill at front 12·0.

Male (Pegu). Length 52·4 inches; wing 22·0; tail 9·4; tarsus 12·7; bill from gape 11·9; expanse 85·0 (*Oates*).

Male (Australia: Phil. Mus.). Wing 19·5 inches; tarsus 12·0; bill at front 12·0.

"Iris bluish brown; bill black, gular skin dusky purple; eyelids dusky purple, turning to pink at the centre of the lower lid; legs and feet coral-red, claws dusky pink." (*Oates*.)

Adult (B. Mus.). Head and neck glossy green-black; the crown, occiput, and nape purple, the whole illumined with a strong metallic sheen; greater wing-coverts, tertials, scapulars, and tail green-black, highly glossed; some of the underlying tertials white, the upper scapulars washed with greyish; all the rest of the plumage pure white.

Immature (Ceylon, June 1875). Wing 23·2 inches; bill at front 10·1, height at anterior edge of nostril 1·9.

Female (Sambhur). Length 52·8 inches; wing 24·0; tail 9·6; tarsus 13·5; bill at front 11·5.

Iris brown; bill black.

(India: B. Mus.) Head and neck greyish brown, blending into the white of the chest; upper back, lesser and median wing-coverts glossy hair-brown; lower back and rump white, washed with brown; quills black, glossed with green; tail whitish at the base, terminal half black; edges of the neck-feathers greyish white.

An example killed in June in Ceylon is in a phase of plumage between the above and the adult dress. Head dark brown, glossed with green; the wing-coverts are greenish black, tipped pale, the lesser series and point of the wing brown, edged with fulvous; primaries white at the base and brown on the terminal portions, the white increasing from the first quill, which is almost entirely brown, to the innermost, the four inner feathers being only tipped with brown; secondaries with the outer webs and tips greenish brown, mingled with whitish.

Obs. Owing to a mistake made by Gould in describing the Australian Jabiru, and Gray probably following him, the latter bird has been considered distinct from the Indian. Gould described the "lower part of the back" as being "rich glossy green," whereas it is white, and exactly the same as in the Indian bird. I have been kindly favoured by the Secretary of the Academy of Natural Sciences of Philadelphia, in answer to my queries on the subject, with a description of Gould's bird, which is preserved in the Museum of that institution. It runs as follows:—"The tail is dark green, but the *whole of the back*" (italics not mine), *the rump, and tail-coverts are pure white*; the dark green scapulars lie across the back, and it at first looks as though the lower part of the back was really dark green." It will be seen, therefore, that there is no difference between the two forms; it is noteworthy, however, that the wing-dimension sent me from Philadelphia is inferior to that of Indian birds; but this is, no doubt, an individual peculiarity. The American Jabirus (restricted *Mycteria*) have the head and neck bare.

Distribution.—This enormous bird is occasionally met with in Ceylon during both the monsoons of the year, which favours the belief that it must be a resident in the island, although its rarity points to the supposition that it is a straggler from India. Layard's experience of it is thus summed up :—"I have only," he says, "seen a few of these huge waders in the Jaffna estuary at Elephant Pass." I have myself heard of its having been seen in some marshes between Batapala and the Bentota river, about 15 miles inland from Amblangoda, but in all my wanderings have only twice met with it myself—once in January 1873 on the Peria-kerretje salt lagoon, and again in July 1875 at Minery lake, on which occasions I saw single birds. In June 1875 the immature specimen above noticed was shot at Vellai plains by a native accompanying Mr. H. Varian, of the Public Works Department, on a trip to that locality. This gentleman has more than once met with it in remote forest wilds; and recently Mr. Bligh writes me of an individual which he unsuccessfully stalked at a lagoon near Yala.

Jerdon states that it is found throughout India, being rare in the south of the Peninsula and more common in Central India and Lower Bengal; but Mr. Hume writes that it breeds pretty well all over the empire in well-watered tracts, where large lakes, jheels, and swamps are common, but is nowhere numerically abundant. The only mention of its occurrence in the Deccan that I find in 'Stray Feathers' is the supposition of Mr. Davidson that he has seen it there. Mr. Ball has only met with it in Sirguja, Lohardugga, and on the southern borders of Raipur, and above Calcutta it is only occasionally met with. In Guzerat, at the opposite side of the empire, it is not uncommon in suitable localities, as is likewise the case in Kutch and Kattiawar. In Sindh Mr. Hume seldom saw it; but higher up the Indus in the Punjab he more frequently met with it. In the Sambhur-Lake district Mr. Adam has only twice seen it. Turning eastward, again, I find that it is resident but not common at Thayetmyo and Rangoon, according to Mr. Oates; and in Tenasserim it is very rare, having only been seen in the north of Palpoo. It extends down the peninsula of Malacca in all probability; for it is recorded from various parts of the Malay archipelago, being common in the Aru Islands, and has lately been recorded by D'Albertis from New Guinea. In Australia it has a wide range, according to Gould, being, however, most abundant on the northern and eastern shores; but even about Moreton Bay and the Clarence River it used to be common. Mr. Gilbert met with it at Port Essington and also in the interior. Recently, in his list of Australian birds, Mr. Ramsay notes it from Pt. Darwin, Gulf of Carpentaria, Cape York, Rockingham Bay, and other places down the east coast to New South Wales.

Habits.—This Stork is not by any means a gregarious bird, being usually seen singly or in pairs. It is partial to salt-water lagoons with shallow foreshores, in which it wades far out from the edge of the water, its length of leg giving it great powers of exploration, and enabling it to keep so much in the open that it is with difficulty approached. The lonely lagoons which are to be found all round the east coast of Ceylon, surrounded by Elephant-jungle, and seldom visited by Europeans, are just the spots for this wary giant among Storks. When disturbed it flies off with slow and heavy flaps of its pinions, and after acquiring sufficient impetus sails lazily on with outstretched wings to a place of safety. It feeds on fish, frogs, reptiles, crabs, and even mollusks, according to Jerdon, who likewise states that a very good *Bhyri* (Peregrine) will strike down this Stork.

Nidification.—Having no record of the nesting of the Black-necked Stork in Ceylon, I append the following extract from Mr. Hume's 'Nests and Eggs':—"It lays, the time varying a good deal according to season, from the beginning of September to the middle of December, and Mr. Horne took hard-set eggs as late as the 27th of the latter month.

"They build upon large trees, very commonly on large Peepul trees; but I have found the nests on Sheeshum, Semul, and many other kinds. The nest, always a great platform of sticks, is sometimes enormous; one I found near Badlee was fully 6 feet long by 3 feet broad, and so deep that three fully-fledged young ones just able to fly were able to crouch in it, so as to be invisible even when the nest was looked at from some distance with binoculars. Usually the nest is from 3 to 3½ feet in diameter, and with a considerable cavity, not so flat as a Vulture's, but with a deep saucer-shaped depression. It is carefully lined with rushes, grass, pieces of 'ban' or grass-rope, water-weeds, &c. One nest that I examined had a regular parapet of mud (the kind of clay we call '*chiknee muttee*') all round the margin of the cavity, some 3 inches wide and 2 inches

high; and Mr. F. R. Blewitt, who watched the birds building this nest, told me that the birds took more than a month building it, taking immense pains to finish it off. When it was nearly ready, they put a sort of rim of clay all round the top of it; the old birds descended alternately to the tank and brought up the mud in their bills, and then standing on the nest, they seemed to manipulate and arrange it with the greatest care with their long bills. These also hatched off three young." He remarks, however, that this was an exceptional nest, as he never saw another like it. Four is the usual number of eggs, but sometimes five are laid. They very often, he says, use the same nest year after year, but very commonly they build a new one.

Mr. Hume further adds:—"These birds have a most remarkable method of paying delicate attentions, or, it may be, merely of dancing. A pair will gravely stalk up to each other, and, when about a yard or two feet apart, will stand face to face, extend their long black-and-white wings, and while they flutter these very rapidly, so that the points of the wings of the one flap against the points of the other's wings, advance their heads till they nearly meet, and both simultaneously clatter their bills like a couple of watchman's rattles. This display lasts for nearly a minute, after which one walks a little apart, to be followed after a moment by the other, when they repeat the amusement, and so on for perhaps a dozen times."

Genus DISSURA.

Much as in *Ciconia*, but with the neck-feathers soft or fluffy, and the upper tail-coverts furcate, very stiff, the exterior feathers reaching to the tip of the tail. Forehead and face small.

DISSURA EPISCOPA.

(THE WHITE-NECKED STORK.)

Ardea episcopus, Bodd. Tabl. Pl. Enl. p. 54 (1783).

Ardea leucocephalus, Gm. Syst. Nat. i. p. 642 (1788).

Ciconia leucocephala (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 277 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 737 (1864).

Ciconia episcopus (Bodd.), Holdsw. P. Z. S. 1872, p. 477; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1108 (1873).

Melanopelargus episcopus (Bodd.), Salvadori, Uccelli di Born. p. 356 (1874); Hume, Nests and Eggs, iii. p. 609 (1875); id. Str. Feath. 1878 (B. of Tenass.), p. 469.

Dissura episcopus (Bodd.), Hume, Str. Feath. 1879 (List B. of Ind.), p. 114.

Violet Heron, Lath.; *Beef-steak bird* in India; *Parson bird* (from its white neck), Europeans in Ceylon. *Manik jor*, Hind., also *Rali*, *Sanku buda konga*, Telugu; *Saudang-lawe*, Java (Horsf.); *Māna koku*, *Vanatay koku* in Manaar.

Padre-koka, lit. "Parson bird," Sinhalese.

Adult male and female (Ceylon). Length 32.0 to 32.5 inches; wing 18.0 to 18.5; tail 7.0 to 7.5; bare tibia 4.0; tarsus 6.0 to 6.5; middle toe 3.3 to 3.5; hind toe 1.2; expanse 67.0; bill to gape 5.8 to 5.9, at front 5.5.—

Male and female (Nepal). Length 35.3 to 37.0 inches; wing 19.6 to 20.5; tail 7.6 to 8.2; tarsus 6.7 to 7.0; bill from gape 6.1 to 6.9; weight 4 lb. 8 oz. to 6 lb. 1 oz.; expanse 70.0 to 74.0 (*Scully*).—*Male* (Pegu). Length 36.0 inches; wing 20.6; tail 8.0; tarsus 6.9; bill from gape 6.8 (*Oates*).

Iris scarlet, with a yellow disk in the sclerotic or space surrounding the iris; bill black, changing to red at the tips of both mandibles, margins red; frontal and facial bare skin leaden; legs and feet dusky red, the edges of the webs whitish. In a specimen apparently not quite adult the iris is reddish orange, with a bluish-brown outer circle. Bare skin along the ulna vermilion-red.

Genus CICONIA.

Bill smaller than in the preceding genera, straight; culmen keeled; nostrils narrow and linear. Wings with the 2nd and 3rd quills the longest. Legs long. Toes short, flattened, bordered by a narrow membrane at the sides and webbed at the base.

CICONIA ALBA.

(THE WHITE STORK.)

Ardea ciconia, Linn. Syst. Nat. i. p. 235 (1766).

Ciconia alba, Bechst. Naturg. Deutschl. iii. p. 41 (1793); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Jerdon, B. of Ind. iii. p. 736 (1864); Dresser, B. of Eur. pt. 19 (1873); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.).

La Cigogne, Buff. Ois. viii. p. 117; *Cegonha*, Portuguese. *Lag-lag*, *Haji lag-lag*, Hind.

Adult female (Furreedpore). Length 51.75 inches; wing 24.0, expanse 77.5; tail 9.75; tarsus 8.5; bill from gape 7.75, at front 7.10 (*Cripps*).—*Adult* (Egypt: Brit. Mus.). Wing 23.75 inches; tail 9.5; tarsus 7.8; middle toe and claw 3.4; bill to gape 7.7, at front 6.7.—*Adult* (England: B. Mus.). Wing 24.5 inches; tail 9.0;

Head and nape black, glossed with metallic green, the feathers not extending beyond the anterior corner of the eye; upper and middle portion of the neck with the throat white, the feathers somewhat decomposed and soft; lower portion of neck and elongated plumes in front overlying the chest brilliant metallic amethystine, illumined with green when viewed against the light, the concealed parts of the feathers blackish green; back, upper tail-coverts, scapulars, and wings black, glossed with green and purple reflections; the feathers along the ulna of the same

tarsus 7.0; middle toe 3.5; bill to gape 7.8.—*Adult* ("Europe": Brit. Mus.). Wing 21.5 inches, bill at front 6.1. There appears to be considerable variation in the length of tarsus.

Iris deep brown; bill red, dusky at the extreme tip; legs and feet pinky red, claws black; orbital skin blackish.

Plumage white, except the primaries, secondaries, primary-coverts, winglet, tertials, and longer scapulars, which are black; the primary-coverts white at the base; shafts of the primaries white at the base; plumes at the lower part of the front of the neck elongated.

Young. Bill yellowish orange, dusky in parts; gular pouch dusky in front, orange at the gape; orbital skin dusky; iris greenish brown; legs and feet pale yellowish, becoming orange in parts; claws yellowish horny (*Scully*). A young bird bred in June measured on the 24th July—wing 19.8 inches, tarsus 8.15; weight 6 lb. 0.5 oz. Plumage similar to the adult.

Distribution.—Until very recently the Stork has never been noticed in Ceylon; and up to the present time, so far as I am aware, no specimens have actually been procured in the island. I have, however, received undoubted evidence of its occurrence in the south-east of the island, where Mr. Bligh met with it near Yāla at the beginning of last year; and I accordingly include the species in the avifauna of Ceylon. At the same time I follow the rule adopted through the work, and include my notice of this bird as a footnote only. The circumstances under which Mr. Bligh met with the Stork are so peculiar that I append his account verbatim:—"I wish I could do justice," he writes, "to a scene we witnessed on returning from Udapottena, which we left at daybreak. The sun was just rising as we neared the ford across a salt lagoon; on the right was a scattered herd of spotted deer scampering off to their prickly coverts. Suddenly rounding a clump of bushes near the ford, and which had hid it from our view, we were astonished to meet within a few yards of us a huge grey Pelican, looking so comical, lazily flapping his big wings, with his head tucked in, while he was being most determinedly attacked by a beautiful White Stork (*Ciconia alba*), which was striking him on the centre of the back with its beak. The Stork was a lovely-plumaged mature bird; its brilliant red beak and legs showed to advantage in the rising sun, and with its black-and-white plumage so clearly defined it looked quite a showy bird compared with the Pelican. What caused the quarrel it is impossible to conjecture; it might be that the Pelican had been poaching on the Stork's favourite fishing-grounds, and the latter had got alarmed on seeing the intruder's mode of scooping up the fish by the score into its capacious pouch!" Subsequently to the receipt of this account, Mr. Parker informs me that he met with several Storks at the tank of Nikaweratiya, which appeared to be breeding there in company with Egrets, Herons, &c.; but I am doubtful as to the correctness of their identification, as the Stork does not breed anywhere in India; and it is possible that the Pelican-Ibis may have been mistaken for the present species, which can only be a migrant in its non-breeding season to the island.

In India the Stork is a common cold-weather visitant, being tolerably frequent in the Deccan, distributed throughout the region between there and Calcutta, near which place it occurs occasionally, as also in Furreedpore, further east; but beyond the confines of Bengal it does not extend. In the north-west of the empire it is scattered moderately throughout the various provinces in the cold weather, and was met with by Mr. Hume in tolerable numbers on the Indus. Dr. Scully found it common in the plains of Kashgharia from April to August, breeding there, and the young remaining until October. Further east it is replaced by a larger species (*C. boyciana*), very similar, but differing in the colour of its bill, which is brown with a reddish base, and in the shape of the nude orbital skin. It is found in Persia and Palestine, passing northward in April through the latter country in such vast flocks that the entire country (rocky hills, oliveyards, sandy plains, and even the dunghills in villages) is covered with them; they remain, moving north a few miles a day, till they have cleared off all the snakes, lizards, frogs, or fish, and they then disappear.

In Southern Africa it winters in abundance, being found in Cape Colony and in Damara Land, and is said by Layard, on reliable evidence, to breed in the former region. It is found on the west coast, and in the northern parts of the continent is very abundant, especially on passage northwards to Europe, in many countries of which it breeds. It nests in the Sahara, in Morocco, and Algeria; and Von Heuglin considers that it may do so in limited numbers in North-eastern

colour as the lower neck, with green reflections; breast, flanks, and axillaries brownish black, illumined at the tips of the feathers with green; under wing blackish green; abdomen, under tail-coverts, inner side of tibia, and tail pure white; under surface of quills metallic green. The curiously forked upper tail-coverts reaching laterally to the end of the tail gives this species, as Jerdon remarks, the appearance of having a double tail.

Young. An immature bird in my collection has the head brown, mixed with green feathers; the upper surface is as

Africa. About January vast numbers of Storks pass through Morocco and over the Straits of Gibraltar, spreading over portions of Spain (in the south of which they commence to lay as early as the latter half of March), and extending northward through France to the Low countries, and eastward thence into Denmark, where it used to be very abundant prior to the draining of the extensive marshes and morasses of the country. Further north still it strays in small numbers into Norway, and perhaps more numerous into Sweden. On its way northward it has from time to time visited the British Isles, having been met with or killed in Hampshire, Wiltshire, Oxfordshire, Suffolk, Norfolk, and Yorkshire, and very rarely in Scotland, having once been shot as far north as Shetland. In the county of Norfolk it has occurred more frequently than elsewhere. Once only has it been obtained in Ireland. Eastward in Europe the migratory stream of Storks seems to be less powerful; but though they pass through Italy in small numbers, visiting the Mediterranean isles on their way over from Africa, yet they muster in considerable force in Germany. Further east again it is more numerous, migrating abundantly from Egypt into Greece, and passing northward into Southern Russia; in Northern Russia it is rare, though it occurs in the Governments of Moscow and Jaroslaf, and further west, in Poland, is very common. Finally, it occasionally happens that flocks diverge westward on their way north from Africa and visit the Canaries, but do not remain in those islands, passing on to the coast of Europe.

Habits.—This Stork is the most sociable of its family, migrating in large flocks, the members of which keep together throughout their journey and fly at an immense altitude. When a halt is made in districts where they perceive that food abounds they are very useful in clearing the country of reptiles, locusts, and small vermin, not frequenting the vicinity of water, but spreading themselves over the plains and fields, each bird keeping a little apart from its neighbour. The males arrive in European countries some days before the females, and employ their time in inspecting their old nests, which they reoccupy every year. In India and other tropical countries where they pass the winter they associate in flocks and frequent open plains. They are held sacred in Mohanmedan countries, and are consequently excessively tame; Col. Irby was informed on credible authority that in some towns in Morocco there is a Stork hospital, where birds that fall from a nest, or get injured in any other way, are sent and cared for! Storks are said to utter no note. They have a habit, when under the influence of any emotion, of clattering their bills, throwing back their heads always while so doing, and violently snapping their mandibles together. In India it is often hawked, and, according to Jerdon, is a common and favourite quarry for the Peregrine. It walks in a stately manner, and is a graceful bird in the way it holds its head and in its general deportment. I have noticed that it stands much on one leg, balancing itself with marvellous steadiness. In Europe it is strictly preserved, and its annual return to the towns and villages where its nests are situated is looked for with great interest by the inhabitants, many of whom consider it a very lucky circumstance to have a Stork's nest built on their chimneys. In Denmark it is the subject of many legends and nursery tales; and the fact of a dead young one or an addled egg being often thrown out of the nest has given rise to the superstition among the peasantry that the bird throws them down to pay its rent. Storks evince great affection for one another: Brehm writes that in Egypt a male has been known to remain behind with a female which had been wounded.

Nidification.—The Stork either nests on trees or on the roofs of buildings; the former are often chosen in Africa and also in Asia; but in European towns the nests are placed nearly always on buildings. I have seen them myself in Strasburg and in Schleswig Holstein on chimneys. The nest is a very large structure of sticks, which is added to year after year until the walls become very high and the fabric so massive that occasionally part of it has to be removed during the winter to relieve the roof of the house from the weight. The old birds have been known to recognize and take possession of the nest after it had been removed during the winter to another spot. The males fight so vigorously for the possession of the females that two have been known to disable each other in these matrimonial battles. The number of eggs laid varies from three to five; they are pure white, and measure about 2.8 to 3.2 inches in length by 2.0 to 2.2 in breadth. The young are fed by the parent birds with food that has been swallowed; on alighting on the nest they throw back their heads over their shoulders, and, pointing the bill upwards, eject the food from their stomachs.

in adults, the plumage being old and abraded, showing that the head is the last to change; there are some brown feathers on the rump, which are evidently the remains of the first winter's dress.

Obs. The African bird is, according to writers, smaller than the Asiatic, as will be seen by Von Heuglin's measurements, which are given as—length 29·5 inches, wing 16·5 to 17·5, tarsus 5·18 to 5·75, bill at front 4·68 to 5·33; Layard, however, gives the wing of South-African examples as 18·5. In addition to this alleged inferiority in size, the webs of the four outer tail-feathers are black, shining, coppery, according to Layard; and if this is the plumage of the adult bird, it will require separation from the Asiatic.

Another species found in India is the Black Stork, *Ciconia (Melanopelargus) nigra*, Linn., which is entirely black, save the lower breast and abdomen, which are white. The black plumage is illumined with violet and green reflections. Length 40·0 inches, wing 20·0 to 23·0, tarsus 7·5 to 8·0, bill to gape 7·8. Iris dark brown; bill dark red; legs and feet dull red; orbital skin red. This species has occurred as a visitor in the Deccan, and may possibly stray as far south as Ceylon.

Distribution.—This handsome Stork is infinitely more numerous than the last two species, being in some parts of the island quite a common bird. It is a resident species, and confined to the northern, eastern, and south-eastern divisions of the island. These birds are liable to be found at any secluded tank in the heart of the forest, and still more so at wild jungle-begirt salt lagoons not far from the sea-shore. South of the Virgel I met with large flocks in October 1875 about salt marshes bordering creeks that ran inland some distance from the shore. In the interior I have seen them at Kanthelai, Minery, Hurullé, Kalpe, and other tanks; and in the Central Province I once met with a flock near Bibile on some elevated patnas. In the Wellaway Korale it is not uncommon; and Mr. Bligh recently met with it near Yāla. Mr. Parker records it from the Uswewa and Nikaweratiya districts, as also from Anaradhapura. Mr. Holdsworth did not meet with it near Aripu; but in the island of Manaar Mr. Simpson tells me it is often seen. I have no record of its occurrence in the Western Province or in the south-west of the island.

It is a common bird in India, more especially, says Jerdon, in well-watered districts. It is plentiful, however, in portions of the Deccan, breeding in the Sholapoor and Satara districts; throughout Chota Nagpur it is, says Mr. Ball, abundant, and is recorded by him from the Rajmehar hills, Manbhum, Lohardugga, Orissa, Nowagarh, and Karial; from Raipur likewise Mr. Hume notes it. About Calcutta it is occasionally seen, and in Furreedpore is common during the rains. Further north it is found along the base of the Himalayas, being common in the valley of Nepal from May till December, in the Nawakot district in November, and in the Terai in December (*Scully*). Going westward now through the North-west Provinces, where it must needs occur, we find it somewhat localized in the direction of the Indus. Mr. Adam notices it as a visitor in the rains to the Sambhur-Lake district; and Captain Butler says it is tolerably common in the plains of Guzerat, and also found at the lake at Mt. Aboo; but Mr. Hume has not seen it in Kutch, Kattiawar, or Sindh, nor has he heard of it from any other part of Jodhpore but the Sambhur Lake. It is not entered in Mr. Doig's list of birds breeding in the Eastern Narra, and it is therefore probable that it does not occur anywhere in Lower Sindh. Leaving India proper we find it spoken of as resorting in flocks to the plains of Pegu during the rains, and also found there in the cold weather. In the province of Tenasserim it is "sparingly distributed in suitable localities throughout the central and southern portions of the province." Mr. Davison has met with it at Amherst, Tavoy, and on the Pakchan. Southward it is found in the Malay countries, and extends to Sumatra and Java, thence to Borneo (from where Salvadori records it, and where Mr. Treacher has recently procured it on the Lāwas river), and finally to Celebes, concerning which Dr. Meyer writes:—"Not rare in the Gulf of Tomini, but rarely goes as far north as Kema, where I got one specimen in May; another one I procured at the lake of Limbotto in July, and one on the Togian Islands in August."

Habits.—The White-necked Stork is partial to dry spots in the vicinity of water; for though it frequently affects the edges of tanks and rivers at times, it is more often seen in the dried-up beds of the same, or on grassy plains near salt lagoons or estuaries of rivers. In the hot season there are numbers of moderately-sized tanks in the forests of the north and east from which the water has almost entirely evaporated, leaving a rushy plain with here and there a few bare places, and near the outlet a muddy pond alive with fish and frogs; it is in such situations that the Parson bird is often found, walking staidly about the bare stretches of baked mud,

feeding on beetles, crickets, &c., or patrolling round the water-holes and capturing frogs, mud-fish, and so forth. In July I found a large flock at Hurullé tank, which roosted in a fine grove of trees at the upper end, and in the daytime frequented the grassy rushy bed of what was once, before the vast bund was broken through, in times gone by, a magnificent sheet of water. It is not by any means a shy bird, and will often suffer itself to be approached within easy gun-shot. Occasionally after being disturbed a flock will rise into the air and circle round and round at a great altitude. Their wings are for the most part kept motionless during these gyrations, but now and then a fresh impetus is given by a few powerful strokes. Mr. Ball speaks of seeing a pair of these Storks flying backwards and forwards through a rising swarm of winged Termites, upon which Rollers and King-Crows were making great havoc, and noticed them repeatedly open and close their bills, from which it may be inferred that they were catching the ants on the wing! The same writer mentions that the Black Stork is very fond of the society of this species, although of a much shier nature. The name of Beef-steak bird is applied to it on account of its flesh being palatable when cooked as steak; and its Hindoo name, *Manik jor*, means, says Jerdon, the companion of Manik, a saint, in consequence of which some Mus-sulmen abstain from eating it.

Nidification.—In Ceylon this Stork does not breed in company with other members of its order, nor with Pelicans &c. I have never discovered a breeding-colony, and I imagine that it nests in the very wildest parts of the jungles. Layard, however, was more fortunate; he says that it breeds on trees in company, "laying several pure white chalky eggs, the surface of which is curiously granulated." The dimensions he gives are 2.75 by 1.86 inches. In Upper India it breeds from the latter end of July to the end of August; but in the south it begins as early as March. Mr. Hume writes that "the nests are placed in large trees, Peepul (*Ficus religiosa*), Burgot (*Ficus indica*), Tamarind, and Sheeshum being the favourites. They are rarely above 20 to 30 feet from the ground, and vary from 14 to 20 inches in diameter, and from 4 to 5 inches in depth. They are densely built of twigs and small branches, and have a considerable depression, sometimes thinly lined with down and feathers, and sometimes almost filled with straw, leaves, and feathers, amongst which the eggs are sunk as if packed for travelling. The full number is four." They vary much in shape, being either long narrow ovals or broad ovals pointed towards one end. They are faint bluish white when fresh, becoming stained and soiled into a yellowish earthy brown. In size they vary from 2.3 to 2.66 inches in length and from 1.75 to 1.92 in breadth (*Hume*).

HERODIONES.

Fam. ARDEIDÆ.

Bill more slender than in the Storks, very sharp; nostrils placed at the basal extremity of a long groove; loreal region bare. Only the outer and middle toe connected by a web at the base; hind toe on the same plane with the front; middle claw pectinated.

Sternum with a narrow emargination as in the last family; breast and lower flanks furnished with powdery tufts of decomposed feathers.

Genus ARDEA.

Bill long and pointed, the culmen nearly straight; the gonys well defined and one third the length of the bill from the gape; nasal groove pronounced; loreal region bare. Wings lengthened; the 2nd and 3rd quills subequal and longest, the 1st less than the 4th; inner webs of quills notched. Tail short. Legs very long; tibia naked far above the knee; tarsal scales broad and transverse, but angulated at the sides; toes lengthened, inner toe considerably shorter than the outer; the web between the outer and middle toe well developed; claws curved, the middle finely pectinated.

Head crested; scapulars elongated, but not "decomposed;" lower neck-feathers in front elongated.

ARDEA GOLIATH.

(THE GIANT HERON.)

Ardea goliath (Temm.*), Rüppell, Atlas Reise nördl. Afr., Vögel, pl. 26 (1826); Temm. Pl. Col. v. pl. 474, 80^e livraison (1829); Blyth, Cat. B. Mus. A. S. B. p. 278 (1849); Jerdon, B. of Ind. iii. p. 739 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1048 (1873); Hume, Str. Feath. 1878, vii. p. 490, et 1879, p. 114 (List B. of Ind.).

Ardea nobilis, Blyth, Ann. & Mag. Nat. Hist. xiii. p. 175 (1844).

Riesenreiher, German; *El mireh*, Arabic.

Note. The bill is slightly curved upwards in this species.

Adult female (Kirinde, Ceylon). Length 53.0 inches; wing 22.0; tail 9.5; bare tibia 5.75; tarsus 9.0; middle toe 6.0; hind toe 5.3; bill to gape 9.0, at front 7.35; weight 10 lbs. (*Bligh*, in epist.).—*Adult*. (India, Ind. Mus.) Wing 24.0; tail 9.0; tarsus 9.5; bare tibia 5.0; middle toe 5.8; bill to gape 9.7, at front 8.1. (N.E. Africa) Length 49.32 to 52.41; wing 20.5 to 21.0; tail 8.0; bare tibia 5.0 to 5.75; tarsus 8.0 to 9.0; bill at front 6.57 to 7.42.

Adult (living, Zoological Gardens). Iris yellow, with a reddish margin; bill dark slaty, under mandible fleshy, with a dark margin; legs and feet dark slaty blackish, edges of scutes whitish; eyelid pale slaty.

(India Mus.) Head (and crest $4\frac{1}{2}$ inches in length) cinnamon-reddish; forehead and lores slaty; hind neck and sides of neck paler cinnamon than the head; upper surface and wings slaty bluish; basal portion of wing-covert feathers rusty red; greater coverts tinged with reddish; primary shafts blackish; tail slaty bluish; chin and upper throat white; fore neck down the centre slaty black and white, the feathers tinged with rufous, the central feathers are white, with slaty black edges; elongated feathers of the lower neck white tinged with rufescent, with slaty brown lateral stripes; feathers of the chest, breast, and underparts dusky cinnamon-rufous, many of the feathers whitish at the edges; the tufts at the side of the chest darker than the rest; under wing dusky cinnamon-rufous, the edge whitish; thighs reddish, tipped with slaty; under tail-coverts reddish ashy.

An African specimen, now living in the Zoological Gardens, from which the description of the soft parts is taken,

* Temminck's description (80th livraison Pl. Col.) to accompany his figure of this species (pl. 474), and at the head of which he bestowed his title of *goliath*, was not published until 1829, as will be seen by reference to the dates of publication of the different livraisons. At the end of the article he remarks that an account of another specimen is to be published ("*sera publié*") by Herr Rüppell; and this appeared, if we are to place any dependence on dates, in 1826, three years prior to Temminck's description. I conclude that the latter author communicated to Rüppell the name he had applied to the species, and that the German made use of it. Be this as it may, Rüppell's account was first published.

has the red portions of the plumage brighter than in the Indian bird above described; the under surface is almost entirely rufous, and the pectoral tufts paler-coloured, without the slate-brown stripes, being simply whitish edged with slaty.

Young: immature bird (Calcutta, Brit. Mus.; *Ardea nobilis*). Wing 21.5 inches; tail 7.5; tarsus 6.5; middle toe 4.3; hind toe 2.0; bill to gape 7.3.

Upper parts dark ashy, the scapulars with light terminal stripes; the entire neck purplish ashy, the feathers lanceolate, and towards the chest with white central shaft-stripes, diminishing towards the upper part into fine shaft-lines; the under surface white, the chest-feathers with ashy margins; forehead ashy brown; crown and sides of the head dark reddish ashy, the crest-feathers 6 inches long, concolorous with the head and some with light shaft-lines; chin and gorge whitish tinged with ash-brown; under wing white.

Obs. Doubts have been expressed as to whether the Indian and African birds are the same; but I apprehend that they are both of the one stock, those that visit India being doubtless stragglers migrating from Africa along the coasts of Arabia to the former country. There appears, at any rate, to be no difference either in dimensions or plumage between Indian and African birds.

Distribution.—The collection of the Colombo Museum has lately been enriched by the acquisition of two specimens of this magnificent Heron. The first was shot by Mr. Le Mesurier on the 4th April, 1878, on the banks of the Mahawelliganga, a few miles above Kandakardu in the Tamankada pattuwa; the second, a female, was killed in the beginning of 1879 at Palatupana, in the Kirinde district, by Mr. Exham Swyny, another example, probably its mate, being seen about the same time at Willapalawewa. Prior to the date of meeting with the first of these examples the bird had never been heard of in Ceylon; but it may have perchance strayed to the island before during the north-east monsoon.

In India it is very rare. Jerdon says that he observed it once on the banks of a river at the foot of the Khasia hills, and in 1845–46 Blyth obtained several specimens in the Calcutta bazaar which are said to have been taken at a salt lake near Calcutta. Since then the species has not been heard of; and Mr. Hume, who has used every exertion to learn something of its distribution in India, and has shown preserved specimens to Calcutta fowlers, who say they have never seen it, has been quite unsuccessful in obtaining any information of the recent occurrence in India of this Heron. He, however, from his remarks concerning some Herons seen in Sindh in 1872, seems to have met with it there. He speaks of six gigantic Herons which baffled all his endeavours to get within shot, and which were twice as large as the common species, and nearly as tall as a pair of Cranes with which they consorted. These could have been no other than the present bird. Westward of this latter region it probably occurs along the shores of Arabia to the Red Sea and the adjacent portion of the continent of Africa, which appears to be its true home. Von Heuglin met with it on both shores of the Red Sea up to latitude 24° N., southwards in the Gulf of Aden, also throughout Abyssinia (whence Rüppell described his specimen) up to 6000 feet elevation, and finally in Tallah, Senaar, East Kordofan, and the country of the White Nile, as far south as the equator. It extends down the eastern side of the continent to the Cape, having been obtained on the Zambezi, at Mozambique, and at Lake Nyassa in the interior, and in all probability it occurs on the shores of all the great inland seas. In the Transvaal Mr. Ayres recently procured it; and in the Lydenburg district Mr. F. A. Barratt met with it on the Vaal river. Layard speaks of it as a regular inhabitant of the bays and mouths of the rivers in Natal, and writes of a male specimen which was procured in Cape Colony at Colesberg. It has been found in Madagascar, and of its occurrence there Messrs. Hartlaub and Schlegel speak. In his 'Birds of Damara Land' Mr. Andersson remarks:—"These fine Herons are not uncommon in the Lake-regions, from whence they make temporary and solitary excursions into Damara Land during the wet season. I have met with them," he says, "on the rivers Okavango and Teoughe, at Lake Ngami, and thence eastward to the river Botletlé." Northward it has been obtained in Gaboon and also in Senegambia; but I am not aware that it has ever been noticed in Morocco or anywhere along the north coast of the continent.

Habits.—This Gigantic Heron frequents the mouths and banks of large rivers and the borders of both fresh- and salt-water lakes. It appears to be almost exclusively a fish-cater, but devours worms, frogs, and reptiles when it encounters them. Mr. Ayres speaks of an example which he shot in the Transvaal having

devoured a whole catfish of at least two pounds in weight, with a head as broad as his hand ; it "had dexterously speared it right through the body behind the head with one mandible, and had evidently clasped it with the other." A second example had swallowed a carp of the same weight. Possessed of such a powerful bill it becomes a formidable enemy when wounded. Mr. Bligh writes me that when the example above alluded to was winged with a charge of No. 2 shot a cooly was sent into the water to capture it ; but the Heron turned on him and fairly kept him at bay until it was killed by a second discharge of small shot. On the Red Sea Von Heuglin noticed it in small parties, sometimes numbering ten individuals ; but elsewhere he found it singly or in pairs. At the seaside he observed it frequenting creeks and islands where the ground was soft, coral reefs, and places overgrown with *Qondel* and *Shora* trees, among which large stretches of ooze had formed. In the Nile district it was to be seen about streams, brooks, swamps, watercourses, and also on the open steppes. He remarks that although a melancholy sort of bird it displays an uncommonly shy and watchful disposition, feeding only in places where it can see far all round, and reposing on wide-stretching sand banks. Its flight is slow and sluggish, with some noise ; and if it is suddenly disturbed it gets up screaming, its loud note falling on the ear like the bark of a large dog. The individual in the Zoological Gardens I found to be a savage bird, but fond of his keeper, from whom it expected food when he visited it. It welcomed him with its wings outspread and its head and neck lowered nearly to the ground ; and while it kept up a constant flapping of its huge pinions it opened its bill wide and emitted a low gurgling cackling note, which increased into a kind of roar when it became excited, and erected its large crest.

Von Heuglin believes this Heron breeds near the Red Sea on *Qondel* trees.

ARDEA CINEREA.

(THE GREY HERON.)

Ardea cinerea, Linn. Syst. Nat. i. p. 236 (1766); Blyth, Cat. B. Mus. A. S. B. p. 278 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Jerdon, B. of Ind. iii. p. 741 (1864); Holdsw. P. Z. S. 1872, p. 477; Von Heuglin, Orn. N. Ost-Afr. iii. p. 1053 (1873); Hume, Str. Feath. 1873, p. 253, et 1876, p. 465, et 1879, viii. p. 112 (List of Ind. B.); Salvadori, Uccelli di Borneo, p. 344 (1874); Legge, Ibis, 1875, p. 403; Hume, Nests and Eggs, iii. p. 610 (1875); David & Oustalet, Ois. de la Chine, p. 437 (1877); Davison & Hume, Str. Feath. 1878 (B. of Tenass.) p. 472; Dresser, B. of Eur. pt. 41, 42 (1875).

Ardea leucophæa, Gould, P. Z. S. 1848, p. 58; id. B. of Austr. vi. (1848).

Le Héron commun, Buffon, Hist. Nat. vii. p. 343.

The Common Heron of European authors; *Garça real*, Portuguese; *Garza*, Spanish; *Fisch-Reiher*, German; *Blaauwe Reiger*, Dutch. *Bou-ank*, Arabic; *Aishoush*, Moorish; *Kabud*, Hind.; *Anjan*, *Sada kanka*, Bengal.; *Saa*, Sindh; *Narraina pachi*, Telugu; *Narrayan*, Tamil (Jerdon); *Zaplia seraya*, Russian, Central Asia (Prjevalsky); *Ukar*, Turki (Scully); *Changa-awu*, Java (Horsf.), *Lou-sse*, Chinese.

Kallapua-Karawal-koka, *Induru-koka*, Sinhalese.

Adult female (Ceylon). Length 38.25 inches; wing 17.0; tail 7.0; bare tibia 2.0; tarsus 5.6; middle toe 4.0, claw (straight) 0.6; bill to gape 5.8, at front 4.5.

Adult males (Yarkand). Wing 18.0 to 18.2 inches; tarsus 6.0 to 6.5; bill from gape 6.3 to 6.5, at front 4.85 to 5.3; bare tibia 2.8 to 3.7 (*Scully*).—*Females*. Wing 17.7; tarsus 6.25 to 6.3; bare tibia 3.1 to 3.2; bill from gape 6.15 to 6.25, at front 4.8 to 4.85.—*Females?* (China). Wing 17.0; tarsus 5.7; bill at front 4.6.—*Female?* (Japan). Wing 17.0 inches; tarsus 6.0; bill at front 4.6.—*Male and female* (England). Wing 17.5 to 18.5; tail 5.0 to 6.5; tarsus 5.5 to 5.8; bare tibia 3.0 to 3.2; bill at front 4.5 to 4.9. (Australia: *A. leucophæa*) Wing 19.0; bill to gape 7.0 (*Gould*).

Iris golden yellow; loreal skin greenish; bill dusky yellow; culmen brownish; legs and feet greenish brown, with the tibia and posterior part of the tarsus greenish yellow.

Male. Forehead, crown, throat, face, and down the centre of the throat white, a broad black band on the sides of the head, commencing just in front of the eye and passing to the occiput, where it forms a lengthened crest, the three longest feathers measuring 5 or 6 inches; neck ashy grey, tinged slightly with reddish, down the white part of the throat a double row of black drop-shaped spots, commencing about 6 inches from the chin, and connecting with two tufts of black "decomposed" plumes on each side of the chest, over which droop a series of long lanceolate feathers, in some specimens 6 inches in length; under surface white; axillaries and flanks blue-grey, with a broad band of black running from the chest-patches down the sides of the breast to the thighs; back, tail, and wings bluish grey; the upper scapulars and interscapular region shaded with darker grey, and the longer scapulars pale grey and very long and lanceolate; greater wing-coverts pale blue-grey; the point of the wing and the edge above and beneath white; primaries with their coverts and the winglet slaty black, the secondaries the same near the tips, and slaty-grey towards the base; tertials slaty grey; shafts of the tail-feathers blackish, under wing-coverts slaty.

Female. Plumage generally duskier than in the male, the occipital crest-plumes not so lengthened, and the breast-plumes not so long.

Nestling: partly in down (Holland). The feathers, which are appearing all over the body, are black on the head, white

on the face and throat, pale slate-grey on the nape, rufescent down the fore neck, slaty brown on the back and wings, and whitish on the breast and underparts; the head-feathers are supplemented by the long grey hairy down of the unfeathered nestling. The "powder-down tracts" are developed from the first.

In the *first plumage* the colour of the back, wing-coverts, and hind neck is ashy brown; the scapulars, tertials, and tail slaty brown; head brown, the feathers with pale mesial lines; the occipital feathers are about 2 inches in length and the sides of the occiput are blackish brown; throat and centre of the fore neck white, the sides of the chest and flanks ashy brown like the hind neck; the black stripes down the centre of the throat tinged with brown, and the tuft at the sides of the chest darker brown than the surrounding plumage, the feathers having whitish central stripes.

After the moult the plumage above is more slaty, but still brownish; the head is blacker, no white on the crown; the pectoral tufts blacker, with broad white stripes.

Immature male in 2nd year (January: Ceylon). Length 40.0 inches; wing 16.5; tail 7.0; tarsus 6.0; middle toe 3.8, its claw (straight) 0.67; bill, gape to tip 6.15.

Iris dingy yellow. Bill—upper mandible dusky reddish brown, the lower fleshy yellow, except at tip; tibia and tarsus vinous brown, paler behind.

Head bluish grey, whitish at the base of the bill, centre of the forehead blackish grey; occipital crest black, but not continued forward over the eye as in the adult, but the space behind the eye is blackish brown, two of the centre feathers with a white mesial line; throat, neck, chest, with the pectoral plumes (which are not elongated), and the under surface white; the black spots down the fore neck fewer than in the adult; lower part of the hind neck bluish grey, darkening into the grey of the back, which is browner than in the old bird; quills the same, the inner webs of the greater wing-coverts brownish slate; tail dark bluish grey; under wing-coverts patched with brownish slate near the edge.

This specimen is in partial moult; the upper surface is in abraded plumage, but the plumes of the breast have the appearance of being new, and there is no sign of the black chest and flank-feathers; so that these, together with the bands at the sides of the head, do not seem to be acquired until after the second moult, or when the bird is in its third year. Some examples, however, have, in the second year, a row of blackish dashes down the sides of the breast in continuation, as it were, of the row down the centre of the throat.

Obs. The grey tints of this bird seem to fade in the tropics; and I question if Ceylonese and perhaps Indian examples are not paler, as a rule, than those from cold climates. A female in my collection has the neck almost white, as also the pectoral plumes.

It is probable that the *Ardea brag*, of Is. Geoffr., founded on a Cashmere specimen, was an abnormally coloured example of the present species. Bonaparte says that it is "smaller, with the whole top of the head black; a long black crest, with the feathers much elongated, and the dorsal plumes dull and somewhat decomposed" (fide *Jerdon*).

The Australian race (*A. leucophæa*, Gould) was separated from the European by its describer on account of its alleged larger size and the upward tendency of the terminal half of the bill. The plate in the 'Birds of Australia' depicts, in all other respects, our species, and it is generally considered that *A. leucophæa* is identical with *A. cinerea*.

Distribution.—This well-known bird is tolerably common throughout the northern, eastern, and south-eastern portions of the island; but it is a straggler to the Western Province south of Chilaw, not breeding, so far as I am aware, between that locality and the Wallaway river. In the south it is to be met with in the Kattregama district, and probably in suitable places at tanks and swamps between there and Batticaloa. It is to be found at Ambaré and Rugam tanks, and in the Tamaukada pattuwa it is not uncommon; it frequents the Minery Lake and the Kanthelai tank, and about Tamblegam and in the vicinity of small tanks along the north-east coast it is resident. At Sieventhampurippu, in the Tirai district, Capt. Wade-Dalton met with it; and I have seen it near Jaffna. At Padewayia and other tanks which abound in large Waders it is doubtless to be found; and in the north-west, at Aripu, Mr. Holdsworth has met with it. In the N.W. Province, Mr. Parker has found it breeding at Nikaweratiya tank.

This Heron is met with throughout India; but is not so common on the eastern side of the Bay, where it has been procured of late only at Thayetmyo by Capt. Feilden; and at Thatone and on the Pakchan river, in Tenasserim, by Mr. Davison. It has not been noticed in the Andamans or Nicobars, although Mr. Hume

met with it on two islets in the Laccadives, and believes that it breeds there. It is recorded as common in the Deccan and in Chota Nagpur, the localities in which Mr. Ball procured it being the Rajmehar hills, Sirguja, Sambalpur, Orissa, Nowagarh, and Karial; about Calcutta it is not very common, but in Furreedpore it is more plentiful. It is found throughout Northern India, and frequents moderate elevations, as well as the plain country, as Mr. Hume has found it breeding up to 5000 feet elevation. It is very common in many places in the north-western district of the peninsula, swarming in Sindh, according to Mr. Hume, and being abundant on the plains of Guzerat, but rare in Rajpootana about Sambhur. Turning to the north-west, we find it in the Punjab and in Cashmir, where Dr. Henderson found it breeding at Srinagar; beyond the Snowy range it is resident at Kashgaria, having been found there about the Panir Lakes, Yarkand, and Kashgar by Drs. Stoliczka and Seully; the latter traveller says it was very common during his sojourn in those regions, and though not frequenting the vicinity of Yarkand from April to August, was found in large numbers near Karghalik. Severtzoff found it breeding in Turkestan up to an altitude of 4000 feet; and Radde found it common in Dauria, breeding in the Aral Islands on the ground; he likewise met with it on Lake Baikal. Schrenck says it is generally distributed along the Amoor, being most common on its southern portion. Przevalsky found it tolerably abundant in Dalai-nor and in the Hoang-ho valley; he also obtained it in Kan-su, but did not see it in Koko-nor; he says it arrives in S.E. Mongolia at the end of March, and is very common in the Ussuri country. In North China it is, according to Père David, very plentiful, breeding even in the interior of the city of Peking. Swinhoe records it from the southern parts, and from Hainan and Formosa. In Japan Messrs. Blakiston and Pryer record it from Tokio and Yezo. It has not been noticed in the Philippines; but in the Malay archipelago Horsfield met with it in Java, and Salvadori doubtfully includes it in the avifauna of Borueo. Further south still it appears to stray to Australia, where Gould met with it in 1839 in South Australia, and received a skin from New South Wales.

Returning to the west of Asia and Europe, we find that Mr. Blanford observed it in Persia, Mr. Danford met with it on the Sihoun river in Asia Minor, and Canon Tristram saw it in Palestine. It is found on the Caspian, and in Southern Russia is common. All through Europe it is pretty generally distributed, migrating north in the summer as far as lat. 68° in Norway. In Denmark and in Sweden and Norway it is a summer visitor, and in some parts of Germany is the same, stragglers only being seen during the winter. It is very rare in Finland; but in Central Russia it is common in some districts, and inhabits both slopes of the Ural mountains. In Belgium, Holland, Great Britain, France, and Spain it is resident, and also in Southern Italy; but in the northern parts of that country Salvadori says it seldom remains. It is resident in Sardinia and Sicily, and a spring and autumn visitor in Malta. It is common in Portugal, and is very abundant near the Straits of Gibraltar in winter according to Col. Irby, a few remaining about Casa Vieja throughout the year. It is migratory, according to Favier, in Tangier; but many are resident as well. Mr. Tyrwhitt-Drake likewise met with it in Morocco. In Egypt Capt. Shelley says it is found throughout the country, and also in Nubia. Von Heuglin says it is found in small numbers all over North-eastern Africa, but more so in the winter than in the hot season. It extends down the east coast to Zanzibar and Mozambique, and thence to the Cape, where it is abundant and resident. Mr. Buckley met with it on the Limpopo, and Mr. Ayres in Natal. It has also been obtained on the Comoro Islands, Madagascar, and Mauritius. On the western coast of Africa, Mr. Andersson met with it commonly on the sea-shore and occasionally inland at Ondonga; further north it has been recorded from Angola, Gaboon, Gambia, and the Gold Coast. In the Atlantic isles it is widely distributed but not common. Mr. Godman met with it in Teneriffe and in the Azores, and says it is occasionally seen in Madeira. Dr. Dohrn records it as a straggler during migration to the north in the Cape Verdes. It is found in the Outer Hebrides, and also in the Faroes as a straggler. In Greenland it has twice been met with, according to Professor Reinhardt, who contributes an interesting note on the subject of its occurrence in 'The Ibis,' 1861, p. 9, by which it appears that one was seen on the 27th of August, 1765, by the missionary Stach, and that another was found dead in 1856 near Nenortalik.

Habits.—To most of my English readers it would seem superfluous for me to remark much on the habits of this well-known bird; but there are many in Ceylon to whom the species is almost unknown, for it is an inhabitant of the wilder districts, and is scarcely so well known as the next bird to be noticed. The Common Heron is found about salt lagoons and forest-begirt tanks not far from the sea-shore; it is, as in Europe, very

shy and keeps well out in the water, when it is shallow enough to wade at a distance from the shore. When looking for fish it stalks along with slow and stealthy tread, generally going in one direction; the neck is stretched out and carried at an angle of about 45° , and the bill held pointed down at right angles to the neck; occasionally I have seen it wading in water up to the body, and with its neck held stiffly out, giving an awkward appearance to the bird. In tidal rivers it usually walks down stream, looking out for fish coming up with the tide; but at the sides of pools and ponds it stands motionless, keenly eyeing the water, with neck drawn in, until a fish is espied, when it darts on it with the utmost rapidity and an unerring aim. Quantities of fish are consumed by Herons, its great partiality being for eels in countries where these abound; but their diet is by no means confined to fish, for, in the winter especially, they frequent the rocks on the sea-shore, and feed on shrimps, crabs, and shell-fish. Water-rats and mice are not unfrequently captured, and bolted head foremost; and in attempting this the Heron sometimes loses its life. Of late years two instances have come under my notice in which birds have been choked in attempting to swallow a rat too large for the throat. In one case a very large rat had been swallowed, and a second was found with its hind quarters hanging from the gape, and the shoulders firmly jammed into the throat. This species will sometimes pounce on a dead bird, as I am informed by a gentleman in Wales, in whose grounds a large Heronry is situated, that he once shot at a Jack-Snipe, which flew some distance and then fell, when it was no sooner snapped up by a Heron which had been flushed by the shot and was flying past where the Snipe dropped. The Heron feeds a good deal by night, frequenting streams flowing through marshes on moonlight nights.

The flight of the Heron is slow, being performed with heavy flaps of the wings; the neck is drawn quite in and the feet extended, the legs brought close together, and sometimes the feet are crossed; and just before alighting, as I observed when standing in a heronry and looking up at the birds, the hind toe is stretched out as if to get ready to perch on the first branch to hand. The ordinary note of the Heron is a loud *krāūk* repeated at intervals; but while breeding its voice is varied. A pair, on alighting on different trees, call to one another with a deep-sounding note like *kronk-kronk*, and when sitting down on their nests one hears a low contented sort of call—*krak, krak, krak*, quickly repeated. It is remarkable how well Herons hold with their feet to a small branch; they are capable of alighting on mere twigs, and keep themselves balanced by flapping the wings. In India, as in Europe, the Heron has always been a favourite quarry for the Falcon, and is said sometimes to inflict severe wounds on its captor with its powerful beak; but, as is remarked by Jerdon (an extract from whose article I have given at p. 104 of this work), it is considered in India quite erroneous that the Heron ever transfixes a Falcon with its bill.

In parts of India this Heron is kept for decoy purposes, as also for food, its flesh being esteemed by the natives. Mr. Hume thus writes of it as observed in Sindh:—"About every fisherman's village hundreds may be seen perched about on the boats, or stacks of brushwood thrown into the water, and on poles, perfectly motionless, and more like stuffed than living birds. The eyelids of all are sewn up; they dare not move, poor things, and wherever they are placed for the day, there they remain immovable. Generally they are lightly tethered by one leg; but I saw several, perhaps old prisoners, in no way tied. Now and again they run their bills along their feathers, or flap their wings feebly; but, as a rule, they stand like statues. The people feed them liberally, and say they grow very fat in confinement, and obviously appreciate them as much as an article of diet as our ancestors appear to have done. Sometimes these birds get loose in this way, or being loose, take it into their heads to fly. I myself saw one go off in this way, and then it mounted in short circles straight up into the sky until we entirely lost sight of it; and this, the boatman assured me, was what invariably happened in similar cases. What eventually comes of these no one seems to know; of course they must ultimately drop exhausted to the ground, but probably at great distances from where they started, for the fishermen say that never, by any chance, do they again see a bird that thus escapes."

Nidification.—The nesting-season of the Heron in Ceylon varies between November and March, in which latter month it commences to lay in England. In the eastern and northern divisions of the island, wherever there is a large breeding-colony of Pelicans, Comorants, Egrets, or Ibises, one is sure to find a few pairs of Herons nesting. They breed at Uduwila and other places in the south, near Trincomalie, Kokelai, and Mullaittivu, and in the Kurunegala district at Nikaweratiya. Besides these situations known to me, there must be many other spots in the northern half of the island. I have found the nests in low trees growing in the

water, and built with those of the White Egret (*Herodias alba*). They are large platforms constructed of good-sized sticks, and measure from 18 inches to as much as 2 feet 6 inches across; but their size depends upon the particular description of fork-branch on which they are constructed. The eggs vary from two to three in number, and are broad almost perfect ovals in shape, the ends in some being slightly pointed. In texture they are rougher than those of the next species; two specimens taken at the Heronry at Kodyam Kulam measure 2.48 by 1.68 and 2.45 by 1.72 inches, and are uniform pale sea-green in colour.

In England, where the Heron breeds alone and not in company with other birds, large numbers congregate together, as many as 100 pairs or more being found in some places. They select by choice Scotch firs, where they are to be had, and build as many as five or six nests in one tree. At a regular date every year, about the latter end of February, the occupants of the Heronry return and set about the work of repairing their nests, commencing to lay in about ten days after their arrival. When sitting on their eggs the head is drawn on to the shoulders, and no sign of the bird can be seen from beneath the nest. When disturbed the old birds manifest considerable anxiety for their eggs, flying round above their nests, and after several attempts at alighting, summoning up courage to settle on them again. The eggs take nearly five weeks to hatch, and the young are about two months before they can fly. They remain about the nests long after they are able to fly, as the Herons are often far from water, and the young are a long time before they can muster courage to go off and fish for themselves. The consequence is a second brood is commenced before the first have left the Heronry, fresh eggs and fully grown young having been found in the same tree. While these birds are about the nests they are fed by the parents now and then during the day; and quantities of fish are found lying beneath the trees in large Heronries, which have been dropped while being taken from the old birds by their inexperienced progeny. In the tropics, where the nests are usually constructed in trees standing in water, the young leave them as soon as they are able to fly at all, and commence foraging for themselves in the surrounding pool or tank. The voice of the young is sharper than that of the adult; but it varies, consisting of several differently-toned notes.

ARDEA PURPUREA.

(THE PURPLE HERON.)

Ardea purpurea, Linn. Syst. Nat. i. p. 236 (1766); Blyth, Cat. B. Mus. A. S. B. p. 278 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Jerdon, B. of Ind. iii. p. 743 (1864); Layard, B. of S. Afr. p. 306 (1867); Holdsw. P. Z. S. 1872, p. 477; Heuglin, Orn. N. Ost-Afr. ii. p. 1051 (1873); Hume, Str. Feath. 1878 (B. of Tenass.), p. 472, et 1879 (List B. of Ind.), p. 114; Salvadori, Uccelli di Born. p. 345 (1874); Legge, Ibis, 1874, p. 30, et 1875, p. 403; id. J. A. S. (Ceylon Branch), p. 55 (1875); Hume, Nests and Eggs, iii. p. 611 (1875); Dresser, B. of Eur. pt. 43, 44 (1875); David & Oust. Ois. de la Chine, p. 438 (1877).

Garça, Portuguese; *purper Reiger*, *roode Reiger*, Dutch. *Nari*, Hind.; *Lal-kank*, in Bengal; *Changa ulu*, Java (Horsf.); *Balakokan*, Borneo; *Pamula nari gadu*, Tamil; *Sannary*, Tamil.

Karawal-koka, Sinhalese.

Adult male and female (Ceylon). Length 38.0 to 39.0 inches; wing 14.5 to 14.8, expanse 55.3; tail 5.0 to 5.5; tarsus 5.2 to 5.5; bare tibia 3.5; middle toe (with claw) 5.0 to 5.5; hind toe (with claw) 3.5; bill to gape 6.1 to 6.2, at front 5.0 to 5.1; weight 2½ lbs. (India) Length 36.0 to 42.0; wing 15.5, expanse 58.0; tail 5.75; bill at front 5.39; tarsus 5.25; middle toe 5.5 (*Jerdon*, who states that some birds are much smaller).—*Male* (England, Brit. Mus.). Wing 14.6; tail 5.5; tarsus 4.9; middle toe 4.3; bill at front 4.9.—*Female*. Wing 14.0; tarsus 4.3; bill at front 4.3.—*Male* (Java). Wing 14.3; tarsus 5.0; middle toe 4.3; bill at front 4.9.

Note. This Heron is remarkable for the great length of its toes.

Iris pale clear yellow, gamboge-yellow in some; loreal skin and base of lower mandible yellowish green; upper mandible dusky yellowish brown, with the margin yellowish; lower mandible yellowish; tibia and inner edge of tarsus with the soles citron-yellow, rest of tarsus and feet wood-brown.

Adult female (Ceylon, February). Head, nape, with crest of several long feathers glossy black, passing down the hind neck in a stripe for about half its length; a black streak from the gape beneath the eye passing over the ears and joining the black of the nape; another black stripe passing from the cheeks down the side of the neck to the elongated neck-plumes, and a pure black streak down the fore neck; lower part of hind neck, back, and wing-coverts bluish slate, tinged with greenish brown on the interscapular region; upper scapulars with the webs open and elongated, the terminal portion cinnamon-red; primaries and their coverts, as also the winglet, blackish slate; secondaries paler; tail dark slate; chin and upper part of throat white; face, sides of neck, fore neck between the stripes, and many of the feathers of the lower neck-plumes cinnamon-rufous, palest above the eye, leaving a white streak next the black cap; the longer feathers of the neck-plumes white, striped with black in continuation of the neck-feathers; sides of the chest and breast dull maroon-red; centre of the breast, the abdomen, and under tail-coverts blackish slate tinged with ashy; thighs light ferruginous; flanks and axillaries bluish slate; under wing, together with the point and edge along the ulna, light ferruginous.

In a male (December) the occipital feathers are longer and the scapulars are purplish and ashy red, being more richly coloured than in the above female; the sides of the head behind the eye are white and not tinged with rufous.

Young, on leaving the nest (Female, Kodiyam Kulam). Wing 11.0 inches (quills not grown); tail 4.0; tarsus 4.5; middle toe 4.0; bill at front 3.7, blunt at tip, the gonys only 1.0 in length.

Iris bright clear yellow; orbital skin yellowish green; upper mandible dark brown, with a yellow line running forward from the eye; under mandible saffron-yellow; tibia and knee greenish yellow; tarsus and toes in front olive-brown, posteriorly yellowish.

Crown and nape black; sides of the head and upper part of the neck rich glossy cinnamon-rufous, changing gradually into slaty brown on the hind neck, and thence into glossy green-brown on the back, scapulars, and wing-coverts,

which are broadly margined with yellowish rufous; primaries, winglet, and tail dark slaty, slightly glossed with green; secondaries paler slaty, glossed in a similar manner; chin and throat white, the narrow black stripe in front as in the adult; sides of the fore neck striped with black, and the rufous ground-colour paling on the chest and under surface into rufescent buff, with broad slaty stripes, except on the abdomen and vent; the latter almost white; under tail-coverts, thighs, and edge of the under wing yellowish rufescent.

An immature bird in first year, and about one year old, measures—Length 36·2 inches; wing 13·2; tail 4·5; tarsus 4·0; bill to gape 6·0.

The plumage is less rufous than in the nestling, the back being slaty grey, with the edges of the scapulars and wing-coverts rufous; the under surface buff-grey, with a few brownish-red feathers on the breast.

Distribution.—This very handsome Heron is fairly common in the well-watered districts of the low country, and is much more numerous in the west and south-west than the last species, though the latter outnumbers it, I think, in the Eastern Province. It is to be found about the marshes near Borella; in the Mutturajawella swamp, at Kotte and near Kæsbawa; and at Bolgodde and Amblangoda Lakes it is numerous. On inland paddy-fields in the Galle and Matura districts it is likewise met with. In the south-east about the tanks near Kattregama, and at similar sheets of water in the Eastern Province, it is to be found in limited numbers; and towards Trincomalie it is commoner again about Topoor and other tanks, and also towards Jaffna near salt lagoons where there are marshes surrounding them. It is distributed throughout the tanks of the interior from Kurunegala westward to Elephant Pass. In the peninsula it is likewise found at the head of the great lagoon near Ethelamaduvil, and at Pt. Pedro Layard met with it. It occurs down the west coast to Chilaw and Negombo in tolerable numbers, and near Calpentyr Mr. Nevill has found it breeding.

In India it is widely distributed in well-watered districts. Mr. Bourdillon found it abundant in Travancore, at the Vellarny Lake near Trevandrum, and in other similar localities it is no doubt plentiful. In the Deccan it is sparingly distributed, but common near Khandala (*Fairbank*). It is found throughout Chota Nagpur, being recorded from the Rajmchal hills, Manbhum, Hazaribagh, Lohardugga, Orissa, Nowagarh, and Karial. About Calcutta it is moderately plentiful; in Furreedpore common and resident; in Caehar plentiful in the rains; in Burmah local, being abundant near Thayetmyo, but not recorded from other places; and in Tenasserim it is very sparingly distributed (*Hume*), being recorded only from Thatone, Tavoy, and Khyketo. It extends to the Andamans and Nicobars; in the former it was procured by Mr. Hume at Tillangchong, by Mr. Davison at Aberbeen, and by Capt. Ramsay at Pt. Blair. In the Nicobars the second-named gentleman got it at Trinkut. Following it southward to the Malay archipelago, we find that Mr. Buxton procured it in Lampong, Sumatra, and Mr. Everett in Sarawak, Borneo, where, however, it is uncommon and seen only during the north-east monsoon; in the latter island it has also been procured at Banjermassing and Pagattan. In Labuan Mr. Mottley met with it, and Horsfield records it from Java. In Northern Celebes Herr Meyer found it common, and he likewise procured it at the Togian Islands. In the Philippines Meyen obtained it at Manilla; and in China it is rare, Swinhoe recording it from Hankow, and Père David from the province of Sezechuen and the vicinity of Peking. It is not noticed from Japan by Mr. Blakiston, though Messrs. Finsch and Hartlaub say that it occurs there. Though ranging as far north, according to Pallas, as lat. 55° in Siberia, it seems to be rare in these regions, as I find no other record of its occurrence north of Turkestan, where Severtzoff says it breeds. This region brings us back again to North-west India, where Mr. Hume says it is common on the banks of the Indus, and about rushy tanks and streams in Sindh, Kutch, Guzerat, and Kattiawar. In Guzerat Capt. Butler met with it in most of the marshes in the plains. Throughout the northern parts of India towards the east it is found in suitable localities, and appears to be common in the Etawah district.

In Palestine Canon Tristram found it abundant in the marshes of Huleh, and says it is resident in other parts of the country; and Mr. Danford records it from Kaiseriye in Asia Minor. It is common in Southern Europe, being recorded as such in Bulgaria (*Elwes*), Southern Russia (*Nordmann*), on the Danube (*Dresser*), and in Greece (*Krüper*). Lord Lilford says that it inhabits the Ionian Islands, and breeds in the Epirus. In Transylvania it is abundant, according to Messrs. Danford and Harvie Brown; and in Italy it is tolerably common, breeding in the country, but not remaining in the winter, though it does in Sicily. In Sardinia it is a bird of passage; and in Malta Mr. Wright met with it only in spring and autumn. It is common

in Spain and Portugal, breeding in large numbers, but does not remain throughout the winter. It arrives near Gibraltar, according to Col. Irby, about the 4th of April. It is tolerably common in France in the summer, and is found in Holland and Belgium, but has not been met with in Denmark, though it has occurred once in Sweden. In Northern and Central Germany it is rare, and to the eastward has not been found at all in Central Russia. It is a rare straggler to Great Britain, having been met with, writes Mr. Dresser, in most of the southern counties, and has been obtained in Scotland as far north as Wick. Concluding with Africa, we find Favier recording it as a summer visitor to Morocco; and it is resident, according to Loche, in Algeria. In Egypt it is a resident and plentiful in some parts, Capt. Shelley instancing the lake of Birket el Korn as being frequented by it in great numbers. Von Heuglin found it all over North-east Africa—throughout the year on the Red Sea coasts, in July and August at Massowa, in autumn on the Somauli coast, and in winter and spring in Abyssinia up to 9000 feet. It has been obtained on the Zambesi, and in the Transvaal it is common, Mr. Buckley finding it breeding there. In Madagascar it has been met with by Messrs. Roche and E. Newton; and in Cape Colony Layard found it common in all marshy places. In Damara Land Mr. Andersson obtained it on the rivers Okavango and Teoughe and at Lake Ngami, and on the west coast of the continent it has been recorded from Casamanse and Bissao. It must needs be abundant in this region in some localities hitherto unexplored, as all the birds which pass southwards from Spain and Morocco in the autumn must winter in West and South-west Africa. I find no record of its occurrence in the Cape Verds; but in Madeira Mr. Godman says it is found, as also in some of the Western Islands or Azores.

Habits.—This handsome Heron frequents marshes more than the banks of streams or margins of lakes, and is particularly fond of tracts of ground covered with long grass and rushes, and interspersed with small water-holes, by the side of which it watches for fish and frogs. I have more than once detected it at a long distance by perceiving its long neck and head peering above the tops of reeds and rushes, and have been able thus to stalk it. Jerdon observes the same habit, and says that its head and neck looking like a snake when in this position has suggested for it its Telugu name. Like the last species, it is seldom seen in company with other Herons; and for the most part I have observed it to be solitary, for more than two or three I have never seen in any marsh together. It often feeds by night, particularly when the moon is up, when it stalks along the edges of streams and water-holes in swamps. It is a very shy species, except when breeding, at which time it will perch readily in trees close to the observer. It roosts on islands, or in any out of the way unfrequented localities, in some of which I have found it resorting to low trees or tall scrub to perch on; but in places where it abounds the *Pandanus*, or serew-pine, is selected by choice.

The flight of the Purple Heron is buoyant but slow, and performed with heavy flappings of its ample wings; it often soars for a short time like the Common Heron. When alarmed it rises with a loud call, which is very like that of the Common Heron, but more guttural.

Nidification.—This Heron breeds in the Western Province in the vicinity of Bolgodde Lake, the marshes round which it permanently inhabits. I found it nesting there in an impenetrable *Pandanus*-thicket in the month of December; but I was unable to ascend the trees to the nests, which appeared to be formed by bending down the leaves of the screw-pine, and on the platform thus formed laying dried reeds and flags. Mr. Hugh Nevill, C.S., who found it breeding in a similar locality near the Puttalam Lake, describes the nests as made in this manner; and it seems, therefore, that this expedient is generally resorted to when breeding in serew-pines. A few pairs were nesting at Uduwila tank near Kirinde in March 1872, but the young were all hatched out. In the north I have found the eggs in December but slightly incubated. At Kodiyam Kulam there were about a dozen pairs breeding, the nests being made on the same trees as those of *Herodias alba*. They were large structures of sticks, more bulky than those of the Grey Heron; the upper surface was only slightly hollowed, there being scarcely enough depression to keep the eggs from rolling out; and indeed, at Bolgodde, I found an egg on the ground, which had probably fallen on this account from the nest. Three is the usual number of eggs in a nest, but in some I only found two. They are rounded ovals, as those of the last species, but they are occasionally pointed at one end. A specimen before me resembles a Gull's egg in shape and measures 2.19 by 1.55 inches. The eggs are paler than those of the Grey Heron, being very light bluish green and some almost bluish white; they vary in size from 2.05 to 2.23 in length by 1.5 to 1.6 in breadth.

The young remain long about the nest before flying, perching on the branches of trees close to their nests; but they are likewise to be seen about the tanks when they are scarcely able to fly, and then skulk among the brushwood like Bitterns. Writing of the nidification of this species in India, Mr. Hume remarks that he has invariably found the nests in thick beds of reeds or bulrushes. In a large jheel in the Etawah district, where a number of nests were found by him in August, they were made on platforms of bulrushes, thirty or forty blades being bent down to form the platform, about 2 feet above the water, on which the nests, composed of sticks and twigs of Babool- and Sheeshum-trees, were constructed; they were loose flat structures from 2 to $2\frac{1}{2}$ feet in diameter. Some of the nests contained as many as five eggs. "The uproar," he writes, "was great whilst the men were robbing their nests; and the extraordinary chattering that the birds made, condoling with each other, when on reoccupying the nests they found them empty, was most comical." Mr. Hume's measurements for the eggs are—length 1.95 to 2.46, breadth 1.42 to 1.75 inch.

ARDEA* GULARIS.

(THE ASHY HERON.)

Ardea gularis, Bosc, Actes Soc. d'Hist. Nat. i. p. 4, t. 2 (1792); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1059 (1873).

Ardea asha (Sykes), P. Z. S. 1832, p. 157; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110.

Herodias asha (Sykes), Blyth, Cat. B. Mus. A. S. B. p. 280 (1849).

Demiegretta asha (Sykes), Jerdon, B. of Ind. iii. p. 747 (1864); Holdsw. P. Z. S. 1872, p. 477.

Demiegretta gularis (Boie), Hume, Str. Feath. 1873, p. 254, et 1876, p. 465, et 1879, p. 114 (List B. of Ind.).

Slate-coloured Heron, Sykes; *Reef-Heron* of some. *Kala bagla*, Hind. (Jerdon).

Note. The bill is slightly curved in this species and its allies.

Adult female (Ceylon). Length 25·0 inches; wing 10·8; tail 4·0; tarsus 3·7; bare tibia 2·3; middle toe 2·6, its claw 0·42; hind toe 1·2; bill to gape 4·3, at front 3·7. Pectination of middle claw rather coarse.—*Adult male and female* (Sindh). Length 24·25 to 27·5; tail from vent 3·0 to 3·8; wing 10·0 to 11·4; tarsus 3·6 to 4·4; bill at front 3·6 to 4·1; weight 1 lb. to 1 lb. 4 oz. (*Hume*). (Bombay: white variety) Length 24·1 inches; wing 10·2; tail 3·8; tarsus 3·8; bill from gape 4·2 (*Hume*). (Egypt) Length 24·0; wing 10·25 to 11·25; tarsus 4·16 to 4·1; bill at front 3·68 to 3·84 (*Von Heuglin*): the measurements for tarsus in the latter case are abnormal.

(Ceylon) Iris golden yellow; bill brownish yellow, paling to yellowish at the tip; culmen between nostrils dark brown; gape greenish; tibia and just below the knee brown; tarsus green, paling to greenish yellow at the tips of the toes. Head (with crest of two attenuated feathers $3\frac{1}{2}$ inches in length), neck, upper surface, and wings dark slate-blue, the scapulars and lower fore-neck plumes pale or grey-slate, the former decomposed, but the barbs joining near the tip to form a lanceolate web, which reaches to within 1 inch of the tip of the tail; lesser wing-coverts and rump nigrescent; primary-coverts and the feathers at their base on the edge of the wing pure white (the fourth feather of these coverts on the right wing is slate-coloured in the specimen under consideration); chin and throat *up to a level with the gape* white, terminating in a point on the centre of the fore neck 6 inches from the chin; under surface from the chest to the under tail-coverts blackish slate; under wing slate-blue, the lesser under coverts nigrescent.

The white primary-coverts (as proved by the presence of a dark feather on one wing) is an abnormal development of white in this specimen. Mr. Hume has recently called attention ('Stray Feath.' 1878, vii. p. 453) to a similar specimen shot in Kutch by Capt. Butler.

White variety. Not unfrequently examples of this species are found pure white throughout. These are not young birds, as was supposed by Jerdon, for Von Heuglin states that he found young nearly all white and others ash-grey in nests.

Young. The nestling, according to Von Heuglin, is either white, variegated more or less with brownish grey, or dusky ash-grey, and these appear to turn as yearlings into pure white or ashy grey respectively. The colour of the latter is much paler than in old birds; and they have, says Mr. Hume, a good deal of white about the abdomen and vent, and occasionally on the centre of the breast, and want the crest and breast-plumes. The absence of the crest seems to mark them as adolescent birds, and distinguishes them from crested adults with such a development of white as I have noticed above. It is, however, possible that old birds with white wing-coverts may have been thus plumaged from the nest.

* I do not adopt the genus *Demiegretta* for this species, as structurally and in character of plumage it is, I consider, a true Heron. Its marine habits are certainly abnormal; but the Common Heron is, in England, much seen on the sea-shore in the autumn; and the Blue Heron of Australia (*A. novae-hollandiae*), by no means a marine species, may be considered to connect the Reef-Herons with restricted *Ardea*. The *Demiegretta* section, in which a white plumage is occasionally assumed, seems to lead to the next subgenus, *Herodias*, or White Herons.

Obs. The Australian and Oceanic bird (*Ardea sacra*, Gmelin), which inhabits the Malay archipelago and the islands in the Bay of Bengal, differs from the present in having merely a narrow stripe of white down the chin and upper throat, which in some specimens is almost wanting. It is shorter in the leg, and the tibia is much more feathered, the bare portion in Andaman specimens varying from 1.05 to 1.5 inch, wing 9.85 to 11.75, tarsus 2.7 to 3.1 (*Hume*). There is a white form in this species as in *A. gularis*. Messrs. Hume and Davison met with it in the Andamans, and Messrs. Finsch and Hartlaub in the Pacific.

Distribution.—So far as I have ascertained, this Heron is confined to the north of Ceylon and the west coast from Manaar down to Colombo. I have not seen it on the eastern side of the island or in the extreme south. Layard procured it from the island of Valenny, near Jaffna, and from a lake near Chilaw (where he found it breeding), and got one specimen on the Colombo Lake. I met with a small flock on the sands at Long Island, at the mouth of the Jaffna Lake, in Mareh; there were several white birds among them, which I take to have been of the same species. A few days afterwards I saw two or three at Manaar; but did not meet with the bird again in any of my wanderings.

On the mainland it appears to be confined to the west coast of the peninsula, taking also the Laccadives into its range, at which group it was noticed by Mr. Hume at Betra Par. There is no reason why it should not extend up the east coast as far as the district opposite Jaffna, as it has been procured lower down near Tinnevely. It has been obtained at Teetul, near Bombay, and in the harbour as well. In the Deccan Sykes procured it about 200 miles inland. Further north it is very abundant in Kurrahee harbour, about the mouths of the Indus and the adjacent creeks, has been obtained in Northern Guzerat near the Runn, and is common all along the coasts of this district and along the Mekran coast to Muscat, as far as which point Mr. Hume has observed it. It probably occurs along the shores of Arabia; for Von Heuglin found it common in the Gulf of Aden and along the coasts of the Red Sea as far north as the tropic, beyond which, to the Gulf of Suez, it is a straggler. On the east coast of the continent of Africa it has been met with at Zanzibar, Mozambique, the Comoro Islands, and also on the coast of Madagascar, in which island Mr. Newton says it is not uncommon. At the Cape it does not seem to have been noticed; but on the west coast it has been procured at St. Thomas's and Prince's islands, at Agupim, on the Gold Coast, and in Senegambia.

Habits.—This Heron is almost entirely a littoral species, being found along the open coast and in harbours and bays, and especially affects coral reefs where these abound. In other localities, where there are sand banks and mud flats, it is to be found feeding at the edge of these, or on the ooze left bare by the tide. The flock I met with at Jaffna were busily attacking a quantity of fish which were hemmed in in a large stake-net on the sand just being left bare by the tide. They did not permit of a near approach, but rose at a very long shot with a flight similar to that of the smaller Egrets. Mr. Hume notices that the blue birds are far less shy than the white ones, as if these latter were conscious that they were more visible than their fellows, and that it was dangerous to allow themselves to be approached. He suggests that originally, when perhaps the species had not taken to frequenting open shores, all the birds were white, and that a marked change in diet might have produced the dusky tints. This species feeds on fish, crabs, small crustacea, and mollusca. Von Heuglin mentions that they are about at nights when there is moonlight, or when the tides are low.

Nidification.—Layard found this Reef-Heron breeding near Chilaw in the months of May and June. He styles the nest a "huge structure of sticks placed in trees by the water's side," and says the eggs are from four to six in number, rounded ovals, and of a pale blue colour. Axis 1 inch 10 lines (1.82), diam. 1 inch 5 lines (1.41). Von Henglin found it nesting on the western coast of the Red Sea in the Dahlak archipelago, the nests being placed both on boulders, in clefts of rocks, and on small trees and bushes, those growing in shallow water being preferred; the nests were placed at heights varying from 3 to 10 feet. Some of the nests were lined with feathers and pieces of seaweed, and the eggs were three or four in number, of a pale green colour, and in shape somewhat compressed at both ends. In length they varied from 1.68 to 1.82, and in breadth from 1.16 to 1.25 inch.

Subgenus HERODIAS.

Bill slenderer and the gonys sharper than in *Ardea*; nostrils slightly oblique; tibia also barer; the tarsal scales more rectangular.

Plumage white; dorsal plumes elongated and highly decomposed in the breeding-season.

HERODIAS ALBA.
(THE LARGE WHITE EGRET.)

Ardea alba, Linn. Syst. Nat. i. p. 239 (1766); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1063 (1873); Dresser, B. of Eur. pt. 77-79 (1880).

Ardea modesta, Gray & Hardw. Ill. Ind. Zool. ii. pl. 49 (1834).

Herodias syrmatorophorus, Gould, B. of Austr. vi. pl. 56 (1848).

Herodias alba (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 279 (1849); Jerdon, B. of Ind. iii. p. 744 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1875, p. 403; David & Oust. Ois. de la Chine, p. 439 (1877); Hume, Str. Feath. 1879 (List B. of Ind.), p. 114 (in part).

Herodias torra (Buch. Hamilton), Hume, Str. Feath. 1878 (B. of Tenass.), p. 472, et 1879 (List B. of Ind.), p. 114.

Great White Heron, Lath.; *Héron aigrette*, French; *de groote Zilverreiger*, Dutch; *Gans*, Dutch in Ceylon (Layard); *Garses*, Portuguese in Ceylon. *Mallang bagla*, *Torra bagla*, Hind.; *Dhar bagla*, Bengal.; *Vella koku*, lit. "White Heron," Tamils in Ceylon.

Baddadel-koka, Sinhalese.

Characteristics. No crest; no pectoral plumes; long dorsal train in breeding-plumage.

Adult male and female. (Ceylon) Length 37.0 to 40.0 inches; wing 13.5 to 15.0; tail 5.0 to 6.0; tibia (bare) 3.5 to 5.0; tarsus 6.5 to 7.1; middle toe 3.5 to 3.8, claw (straight) 0.6; bill at front 3.9 to 4.5, to gape 4.9 to 5.8. (India, Tenasserim) Length 35.0 to 38.5; wing 13.2 to 17.2; tail 5.5 to 7.0; tarsus 5.25 to 7.9; bill at front 3.72 to 5.0 (*Hume, Scully*). (China) Wing 14.2 to 14.75; tail 5.0 to 5.2; tarsus 6.0 to 6.5; bare tibia 4.5; bill at front 4.3 to 4.5. (Egypt) Length 42.0; wing 16.5; tarsus 7.6; bill at front 5.0 (*Scully*). (N.E. Africa) Length 36.1 to 36.4; wing 14.1 to 15.45; tarsus 5.51 to 6.45; bill at front 4.1 to 4.85 (*Heuglin*). (Russia) Wing 16.1 to 16.3; tail 6.4 to 6.5; bare tibia 3.5 to 4.2; bill to gape 6.0 to 6.4. (Syria) Wing 16.0; tail 6.5; tarsus 7.0; bare tibia 4.0; bill to gape 6.0 (*Dresser*). (Australia) Wing 13.0; tail 5.0; tarsus 5.3; bare tibia 3.62; bill at front 4.3. (Kashgaria) *Male.* Wing 17.6; bill at front 5.05, from gape 6.6; tarsus 7.7 (*Scully*).

Breeding-plumage. Iris bright pale golden yellow; bill blackish; loreal skin and space round eye greenish yellow; legs and feet black; tibia paler than the tarsus.

Entire plumage white; a train of long feathers, with stout shafts and very open lengthened and drooping barbs, arises at the base of the scapulars and extends 4 inches beyond the tail. The bill remains black a very short time, turning yellow long before the dorsal train is moulted; the tip, however, is black at this stage.

Winter plumage. Bill yellow, the tip dusky; tibia as black as the tarsus. As in summer, but with the dorsal train wanting. In June this plumage is complete.

Young. Nestling covered with white down; the legs brownish.

Obs. The Indian race of the Large White Egret has been separated by Mr. Hume as *H. torra*, on account of its small

size. It is no doubt a small race, but not more diminutive than most of the African examples that have been met with, and is no smaller than the Chinese and Australian birds. It is a species which varies extremely in size, *tropical bred* birds being the smallest. There is, however, a regular gradation as regards dimensions from the Australian, Chinese, and Indian races up to the largest examples reared in cool climates, to which, I apprehend, the large individuals occasionally procured in India belong. Moreover, as will be seen by reference to the dimensions tabulated above, the difference in tarsus and bill of the largest birds is not proportionate to the length of wing. Under these circumstances it is not advisable to adopt any new title for the small form, particularly as we do not know whether the Linnean type was a small or a large bird.

As regards Buchanan Hamilton's name *torra*, I can find no mention of this bird in the writings of that gentleman, although there exists a reference of Franklin's—"Ardea torra, Buch." P. Z. S. 1831, p. 123. Giebel, in his 'Dictionary,' refers us to Bonaparte's Consp. vol. i. p. 425; but the only reference I can find in this work is in vol. ii. p. 118, where *Ardea torra*, Buch., ex Asia meridionali, is used as a synonym of *A. nigrirostris*, Gray and Hardwicke. It is possible that the title may have been used by Buchanan Hamilton as a MS. name, in which case it would not stand; and it appears to me that if a new name is wanted *A. modesta*, Gray and Hardwicke, Ill. Ind. Zool. ii. pl. 49 (1834), would be the next title in order available.

Distribution.—The Large Egret is widely diffused throughout the low country, but is most numerous in the dry districts east of Tangalla, and round that side of the island to the Vanni tanks in the north. It is to be found in all large marshes and tanks throughout the northern half of Ceylon down to Kurunegala, and south of that district may generally be met with where there are extensive tracts of wild paddy-land. In the interior between Colombo and Matara, where the fields happen to be surrounded by forest and jungle, one or two of these Egrets may usually be seen in company with the next species. It is not at all uncommon in the Trincomalie district, but I have never met with it in any great numbers. I have heard of its being observed in Dumbura, whither it ascends from the Bintenne country; but I fancy that it is nothing but a rare straggler to that elevated valley.

In India it is a very common bird, being, of course, most abundant in the better-watered districts, says Jerdon, but may be found everywhere feeding by rivers and tanks. It is said to be very common in the Deccan, and in the region between the Ganges and the Godaveri. Mr. Ball records it from Manbhum, Lohardugga, Nowagarh, Karial, and Raipur. About Calcutta it is occasionally met with; but I notice it is omitted from Mr. Cripps's list of the birds of Furreredpore. Passing eastwards I find it reported by Mr. Oates as common about Thayetmyo, and by Mr. Hume as generally distributed throughout the plains portion of Tenasserim. It is likewise found in the Andamans. Returning to India, it is recorded by Dr. Seully as occurring in the valley of Nepal in the winter; and evidently is found all along the base of the Himalayas, as also in the plains westward to the Punjab. In Sindh it is common, and is distributed less numerously throughout the entire surrounding region. In Kashgharia, which is inhabited by the largest form of the species, it is common in winter, migrating northward in the spring to breed. According to Severtzoff it breeds throughout Turkestan, and winters in the western portions of the country. Eastward we find Przevalsky observing it in large numbers in the Hoang-ho valley. At Koko-nor it was met with at the end of March; and in Tsaidam it appeared as early as the 18th February. It is spread throughout the Chinese empire, breeding in large numbers near Peking; and Swinhoe met with it in Formosa. In the Malay archipelago, through which it extends to Australia, it is found in Borneo, Celebes, Halmahera, Morotai, Ternate, Timor, and the Aru Islands. It has been recorded by Mr. Ramsay from every settlement in the north of Australia, and from most parts of the east coast down to Victoria, and thence round to South Australia. Gould likewise met with it on the Clarence River and in the north of Tasmania on the mouths of rivers. Returning to Asia again, to follow out its distribution from thence westward, I find that Dr. Radde observed it in the Central Argunj valleys, and on the Lower Udir river in Siberia. Major St. John met with it in the Shiraz district in Persia; and Mr. Blanford saw it in Baluchistan; while Canon Tristram found it to be a spring and summer visitor to Palestine. In Asia Minor it is common; and in Greece slightly less numerous, though, according to Messrs. Elwes and Buckley, it is common in the marshes of Macedonia. In South-eastern Europe it is much more plentiful than further west, for in Spain it is very rare; and in Portugal it is said not to be found at all, although it is recorded by Mr. Godman from the Azores. It is likewise rare in Malta, though tolerably common in winter in Sicily and Sardinia; but it is scarce again in Northern Italy. In Transylvania it is

found on migration; but it breeds in the marshes of Hungary and in the countries skirting the Danube, this portion of Europe being, writes Mr. Dresser, its head-quarters on that continent. It is likewise met with in Southern Germany but very rarely; and the same is the case in Poland. It is, however, common in parts of Russia, particularly in the southern districts. Passing westward now, I find that this Egret is rare in France, and has only been once killed in the Netherlands. It strays still further north into Scandinavia, but does not reach Finland in its migration. It is a straggler to Great Britain, having been met with or procured more than a score of times, in most of which it has been found on the eastern side of the island, having once strayed into Scotland.

In parts of the continent of Africa it is abundant, particularly in the north-east, being found plentifully in Lower Egypt, where it breeds in the Nile delta. In Abyssinia it winters, frequenting the Blue and White Nile, and ranging into the highlands to an altitude of 9000 or 10,000 feet. Canon Tristram met with it in small flocks in various parts of Algeria, and found it wintering in the Sahara. Down the east coast it has been observed at Mozambique and Natal; and Layard met with it in various parts of South Africa, among which may be mentioned the vicinity of Cape Town and Simon's Bay; while from Madagascar it has been recorded by Messrs. Hartlaub, Schlegel, and Newton. Following up the west coast, we find Mr. Andersson obtaining the present species in Damara Land, while it is otherwise recorded from Benguela and the Gold Coast.

Habits.—In Ceylon this fine Egret affects by choice large paddy-fields and flooded marshes; but it is also encountered on the borders of tanks, and occasionally about shallow brackish lagoons. It is often met with singly and seldom more than three or four are seen together in even scattered company. It is very wary, and generally stalks about in the water or watches by pools at some distance from the surrounding cover, so that it is very difficult to approach, as it generally takes flight as soon as it perceives the shooter approaching, and flaps leisurely off to another spot, or mounts to the top of some tall tree, and there watches its pursuer at a safe distance. It is given to perching on trees quite as much if not more than either of the two smaller species; and when resting on the tops of the tall forest trees of Ceylon it presents an imposing appearance, even when in an attitude of repose. Its flight is, like that of the Common Heron, slow, being performed with measured strokes of its ample wings; and with its neck drawn in and its legs extended behind it, it forms a handsome object as it lazily flaps away to its feeding-grounds in the early dawn. I have often seen it, both feeding and flying, in the company of its smaller congeners, next to be noticed, and it invariably breeds in their company in Ceylon. It leaves its feeding-grounds early in the evening, and resorts at once to the tall trees on which it nightly roosts. It is, as a rule, a silent bird, but when put up now and then utters a single note like *kar*.

Nidification.—In Ceylon the Great White Egret nests in December, January, and February, breeding in company with Herons and other Egrets. At the colony at Uduwila a number of pairs were nesting on the same trees with Spoonbills and Pelican-Ibises. The nests were smaller, of course, than those of either of these species, and were placed on the topmost branches. The surface of the nests was almost flat, there being scarcely any hollow for the reception of the eggs, which lay on a lining of roots and twigs. At the end of March, the time of my visit, most of the young were hatched out; they either stood on the nests or took refuge in the surrounding branches, perching readily on them. The eggs are three or four in number, moderately smooth in texture, nearly regular ovals in shape, of a uniform pale greenish-blue colour. A small series in my collection vary in dimensions from 2.04 to 2.2 inches in length, and from 1.39 to 1.53 in breadth. In the north of Ceylon, at a tank near Nilāvele, this species was found breeding by me in January, nesting in trees with the Purple Heron and the two species next in order. The nests were similar to those just described, and were built on thorny trees growing in the tank. The old birds were very shy, flying off when the first shot was fired and perching on the tops of distant trees. In India this species breeds between the months of October and February, resorting, as in Ceylon, to tanks, in the beds of which there are groves of trees whose trunks are submerged in the wet season. According to Mr. Hume, the eggs vary in length from 1.88 to 2.38, and in breadth from 1.4 to 1.6 inch.

HERODIAS INTERMEDIA.

(THE PLUMED EGRET.)

Ardea intermedia (Hasselq.), Wagler, Isis, 1829, p. 659; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111; Schlegel, Mus. P.-Bas, *Ardeæ*, p. 19 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1065 (1873); Hume, Nest and Eggs, iii. p. 615 (1875).

Ardea egrettoides, Temm. Man. d'Orn. iv. p. 374 (1840).

Ardea plumifera, Gould, B. of Austr. vi. pl. 57 (1848).

Herodias intermedia (Wagl.), Blyth, Cat. B. Mus. A. S. B. p. 279 (1849); Salvadori, Ucc. di Born. p. 348 (1874); David & Oust. Ois. de la Ch. p. 440 (1877); Hume, Str. Feath. 1879 (List B. of Ind.), p. 114.

Herodias egrettoides (Temm.), Jerdon, B. of Ind. iii. p. 745 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1874, p. 30, et 1875, p. 407.

The Lesser White Heron. *Patangkha*, *Patokha bagla*, Hind.; *Paru vallai koku*, Ceylonese Tamils.

Hotta-kallu-koka, Layard (refers probably to next species), *Sudu-koka*, lit. "White Heron," Sinhalese.

Characteristics. *No crest: long dorsal train and long pectoral plumes in breeding-season.*

Adult male and female (South Ceylon). Length 25.75 to 26.1 inches; wing 12.0 to 12.1; tail 4.75 to 5.0; tarsus 4.5; bare tibia 2.5; middle toe 3.1 to 3.2, its claw 0.6; hind toe 1.4; bill to gape 3.7, at front 2.75. Claws acute, pectination of middle toe shallow and wide.—*Adults* (India and Andamans). Wing 11.1 to 12.65; tail 4.5 to 5.9; tarsus 4.1 to 4.6; middle toe and claw 3.62 to 4.05; bill at front 2.68 to 3.05 (*Hume*).—*Female*. (Java) Wing 11.6; tail 4.5; tarsus 4.0; middle toe 2.9; bill at front 3.0.—*Male* (Canton). Wing 11.6; tail 4.5; tarsus 4.3; bill at front 2.85.—The bill is proportionally shorter in this species than in other white Egrets.

Breeding-plumage. Iris golden yellow; bill black; legs and feet black; tibia yellowish brown. (Canton) Entire plumage white; dorsal train composed of long, pliable-shafted, highly decomposed feathers, the webs drooping, reaching $5\frac{1}{2}$ inches beyond the tail; pectoral plumes of long, attenuated, and decomposed feathers $5\frac{1}{2}$ inches in length.

Winter plumage (Ceylon: November). Bill yellow, the tips dusky; orbital skin greenish yellow; legs and feet entirely black. Entire plumage white, without the dorsal train and pectoral tuft.

Young. The nestling is clothed with white down.

Obs. As will be seen from the above measurements, Ceylonese specimens are not inferior in size to those from any other part. According to data in Mr. Hume's useful table of Indian Egrets (Stray Feath. vi. p. 480), the dorsal train extends 7 to 8 inches beyond the tail in some specimens. This, I presume, is exceptional, although it is represented as of great length in Mr. Gould's plate of the Australian bird. Females from the Transvaal measure in the wing 11.75 and 12.25. In a winter specimen (June) the tarsi and feet are noted as bluish.

The American representative of this species is *H. egretta*, and has the bill yellow at all seasons.

Distribution.—This Egret has much the same distribution in Ceylon as the last, and, though it will occur in some tracts of country and not in others, is, I think, quite as numerous if not more so than its larger relative. I found it common in extensive paddy-fields near Bolgodde lake in the Western Province, and also in the Galle district, particularly in unfrequented fields in the heart of jungle. In the south-east I found it breeding at Tissa Maha Rama, and noticed it in other places in the Hambantota district. In the Eastern Province it occurs here and there; and some white Egrets I met with flying over the elevated tract of country between

Bibile and Kaloday, on the Batticaloa and Badulla road, I identified as the present species. Northward, about Trincomalee and in the vicinity of various large tanks in forest districts, I met with it; but it is not so common there or in the Jaffna peninsula as *H. garzetta*. Down the northern half of the west coast it is probably distributed as in other parts, but I did not take particular notice of it there. Between Puttalam and Kurunegala it is not uncommon; and Mr. Parker has met with it in various parts of the North-western Province. In the lower valleys of the Kandyan country I have seen white Egrets; but I do not know whether they were this or the next species.

In India this Egret is common; but, according to Jerdon, not so plentiful in the south, though common in the north-east and abundant in Burmah. With regard to the latter district, I find that Mr. Hume has no recent record of its occurrence in the southern parts; but Captain Feilden met with it at Thayetmyo, and further west towards India proper it is a visitor to Cachar in the rains. In the Andamans it is pretty common, though nowhere numerous; but Mr. Davison does not record it from the Nicobars, although Mr. Hume thinks he saw it there. About Colombo it is tolerably common; but I observe that it is passed over in Mr. Cripps's list. In the western parts of Chota Nagpur it is rare; but elsewhere in that division it is common, Mr. Ball recording it from Manbhum, Lohardugga, and Singbhum; it is also found in Raipur. In the Deccan it is common. As regards the north-western portion of the empire, Mr. Hume writes that this species is not uncommon in Northern Guzerat, and has been shot at Mt. Aboo, being likewise pretty common in Kutch and Kattiawar, and very abundant in Sindh. It is, I conclude, found in the Punjab; but it does not appear to extend in a northerly direction into Turkestan or Kashgharia, nor do I find mention of it in Przevalsky's 'Birds of Mongolia.' Eastwards, however, it is found permanently in the southern and central portions of China, and ranges in the summer, according to Père David, as far north as Pekin. In Japan Mr. Blakiston notes it as occurring in Yezo. Going south now we find it recorded from the Philippines by Schlegel, and in the Malay archipelago it is said to be the commonest of the white Egrets. It is there found in Java, Borneo (Sarawak), the Aru Islands, and also New Guinea. It extends to the continent of Australia, where it is the *Ardea plumifera* of Gould, being there found along the northern coasts and down the eastern shores to Victoria; thence westward it extends to South Australia. Crossing over to Africa I find that it is resident in the southern portion of the continent, breeding near the Knysna in Cape Colony; and in Transvaal it has been procured in June and September. It is recorded from Mozambique, and also from Lagos on the west coast. In North-eastern Africa Von Heuglin met with it in autumn and winter in the Kordofan swamps, and on the Blue and White Nile; but in Lower Egypt it does not appear to be found, as it is omitted from Captain Shelley's book. It is doubtfully recorded by Von Heuglin from Syria on the authority of Hemprich and Ehrenberg.

Habits.—Like the larger Egret last noticed, this species frequents paddy-fields, marshes, and flooded lands in Ceylon; but whereas the latter is generally seen singly, the present bird is usually found in small troops of four to a dozen or so. It is a shy bird, and cannot easily be approached within gunshot unless it is stalked; but in the evening, when it assembles to fly off to its roosting-place, the collector, by taking up a judicious position, may shoot it while passing over him. It roosts in trees, and during the daytime, when disturbed, perches on the very topmost branches, its snow-white plumage presenting, particularly in the northern forests, a beautiful appearance from such a position. At the borders of paddy-fields and swamps it may be seen perched on mangroves and screw-pines. It is a very silent bird. It feeds mostly on fish, and darts out its neck very rapidly on its prey. I have, however, observed it hooking food out of the water with its feet. In Sindh this species is, in common with others, captured by native fishermen partly as a decoy for other birds.

Nidification.—This Egret breeds from December until March and April. In May Layard found eggs hard-set in the heronry between Tangalle and Matura. I have found it breeding in March at the small tank (Uduwila) already mentioned; also at a tank within a few miles from Trincomalee in January, about which time it nests at other localities in that district. In December Mr. Parker has taken its eggs at Nikaweratiya tank. The trees chosen are generally of a thorny nature, growing in the water of flooded tanks; in the upper branches of these the nests, which are large stick-structures, are placed, sometimes in company with those of other species, or in a tree by themselves to the number of eight or ten. They are repaired yearly, and are flat

and about 18 inches in diameter, the lining consisting of small twigs. The eggs are three or four in number, and are regular ovals in shape, some being slightly pointed at both ends, and others more rounded, with a greater diameter. The texture is smooth, and the colour pale sea-green. Several examples in my collection measure 1.93 by 1.35, 1.78 by 1.38, 1.91 by 1.34, 1.84 by 1.32, 1.88 by 1.42, 1.93 by 1.38 inch.

In India this species breeds in July and August in the north, and in December in the south; it nests commonly in towns, according to Mr. Hume, in company with Pond- and Cattle-Herons. In writing of a colony in some old tamarind-trees in a graveyard at Etawah, he says, "On one tree we counted 198 nests, the greater number of which were occupied. On one nearly horizontal bough we counted, in a length of 21 feet, eighteen nests, all side by side on the flat surface of the bough, with barely room, in most cases, for one bird to stand between each nest, and with no room at all in some." The measurements given of the eggs are—length 1.68 to 2.08, breadth 1.32 to 1.52 inch.

HERODIAS GARZETTA.

(THE LITTLE EGRET.)

Ardea garzetta, Linn. Syst. Nat. i. p. 237 (1766); Gould, B. of Europe, iv. pl. 277 (1848); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111; Von Heuglin, Orn. N.O.-Afr. ii. p. 1067 (1873); Hume, Nests and Eggs, iii. p. 616 (1875).

Ardea nigrirostris, J. E. Gray, Zool. Miscell. p. 19 (1831).

Ardea nigripes, Temm. Man. d'Orn. iv. p. 377 (1840).

Herodias garzetta (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 279 (1849); Jerdon, B. of Ind. iii. p. 746 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1872, p. 30, et 1875, p. 403; Ramsay, Proc. Linn. Soc. Sydney (List Austr. B.), p. 23 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 476, et 1879 (List B. of Ind.), p. 114; David & Oustalet, Ois. de la Chine, p. 440 (1877).

Little Egret, Lath.; *La Petite Aigrette*, Cuv.; *White Heron*, *Black-billed Heron*, *Paddy-bird*, Europeans in Ceylon. *Beiadi*, Arabic (Von Heuglin); *Kilchia*, Hind. (Jerdon).

Sudu-koka, Sinhalese, lit. "White Heron." *Garça*, Portuguese.

Characteristics. *Crest, dorsal train (curved up at the end), and pectoral plumes in the breeding-season; bill black at all seasons.*

Adult male (Ceylon). Length 25.0 to 26.0 inches; wing 11.0 to 11.6; tail 4.0; tarsus 4.0 to 4.4; bare tibia 2.0; middle toe 2.7, claw 0.5; bill to gape 4.0 to 4.2, at front 3.6.—*Female*. Length 22.5 to 23.0 inches; wing 10.5 to 10.8; tarsus 3.8; pectination of middle claw deep and angulated.—*Adult*. (India, Andamans) Length 23.0 to 26.0 inches; wing 9.8 to 11.4; tarsus 3.7 to 4.5; bill at front 3.1 to 3.6 (*Hume*). (China) Wing 10.8 to 11.2 inches; tarsus 4.0 to 4.2; bill to gape 3.8 to 4.0. (N.E. Africa) Length 24.0 to 24.13 inches; wing 10.0 to 10.5; tarsus 3.84 to 4.19; bill at front 3.15 to 3.38 (*Von Heuglin*). (Europe) Wing 11.5 to 12.07 inches; tarsus 3.85 to 4.39; bill at front 3.3 to 3.7 (*Schlegel*). (S. Africa) Wing 12.0 inches (*Layard*).

Breeding-plumage (Ceylon). Iris golden yellow; loreal skin and gape greenish yellow; bill entirely black; legs black; feet and lower part of tarsus greenish yellow; claws black. The tips of the toes are sometimes black, and the green ascends the tarsus less in some than in others.

Plumage entirely white; a dorsal train of decomposed feathers, with the barbs very long, and the tip of the shaft, which is as fine as the barbs, curved up and reaching about one inch beyond the tail; an occipital crest of two attenuated feathers 5 inches in length; lower neck-plumes composed of highly attenuated feathers $4\frac{1}{2}$ to 5 inches in length.

An example from Amoy has the crest 6.5 inches in length.

Winter plumage. Base of the bill beneath whitish; crest and dorsal train wanting; pectoral plumes not so elongated.

The *breeding-plumage* is put on in Ceylon about October or November, and worn till about March; some examples which I have shot in January have not had the crest, and may be perhaps yearling birds.

Young. Covered as nestlings with white down, and in first plumage white, without the pectoral plumes.

Obs. Considerable difference in size exists in this Egret; but birds from all parts are clearly referable to only one species. The largest dimensions, it will be seen, are those of European and South-African birds.

H. eulophotes, Swinhoe, found in China, and ranging into Malacca and Tenasserim, is a smaller species than the present, and differs from it notably in having the bill yellow in the breeding-season and black in the winter. An Amoy

specimen before me (28th May) measures—wing 9·4 inches, tarsus 3·0, bill at front 3·05. The dorsal train reaches half an inch beyond the tail, the pectoral plumes are rather broad and 3·0 inches in length, and the crest measures 3·5 inches.

Distribution.—This handsome Egret is apparently not so widely spread in Ceylon as the last species. It is for the most part found in the northern half of the island, being common in the Jaffna district and along the east coast as far south as Batticaloa at any rate. Southward I have met with it at the tanks north and east of Hambantota. I have never shot it in the Galle district, and do not think it is to be found there except as a straggler. It is sometimes met with in the Western Province, and in the North-western is, according to Mr. Parker, not uncommon; in fact it probably occurs at all large tanks and suitable marshes &c. throughout the northern forests. Mr. Holdsworth has seen an Egret with black bill and greenish feet at Nuwara Eliya, which must be the present bird; and I have no doubt that white Egrets which occur in Dumbara include this species.

The range of this Little Egret is very wide, as it is found on both coasts of Africa, in Southern Europe, throughout Asia (as far north in the western division as the sea of Aral, and in the eastern as high up as Japan), in various islands of the Malay archipelago, and in portions of Australia.

Commencing, as usual, with India, we find that it is very abundant in Sindh and common throughout the surrounding regions, being particularly numerous in the Deesa district (*Butler*). It is commoner than the last in parts of Rajpootana, and is no doubt found in the Punjab. It is not uncommon in the North-western Provinces and in Lower Bengal, being occasionally seen in the Calcutta market, and occurring numerously in Furreedpore in the cool season, but resident in Cachar, according to Mr. Inglis. In the division of Chota Nagpur it is common, except in the western district, and is recorded by Mr. Ball from Manbhum, Lohardugga, and Orissa. In the Deccan it is plentiful; and further south it no doubt occurs at all suitable places, being probably numerous in the south-east of the Carnatic. Turning eastward, it is recorded from Thayetmyo, but not from the Irrawaddy delta, and is said to be pretty common throughout the plains of Tenasserim. Southwards it is found in Malacca, and in the Andamans is not uncommon. At Acheen Mr. Davison found it frequent about streams; and it doubtless occurs elsewhere in Sumatra. It is omitted from Salvadori's list of the birds of Borneo, but is recorded from the Moluccas and from Celebes and the Togiau Islands, where Herr Meyer procured it between the months of May and August. In Australia it is found on the shores of the Gulf of Carpentaria, and down the east coast to Wide Bay. Returning to the north, I observe that it has lately been procured recently by Mr. Everett in Luzon during the month of March. It likewise inhabits Formosa and Hainan, and in the south and centre of China is resident, and in the summer is found throughout the entire empire. In Japan it is very common in the south, and likewise occurs in Yezo. In the highlands of Central Asia it does not seem to have been met with, nor does Severtzoff record it from Turkestan; it has, however, been found on the shores of the sea of Aral and the Caspian; and in Palestine Canon Tristram observed it frequently in the marshes of Huleh and about the sea of Galilee. It is recorded from Asia Minor and is also found on the shores of the Black Sea, arriving, according to Messrs. Elwes and Buckley, on the Danube in large numbers about the first week in May, and commencing then to breed, one of its colonies being on an island below Rustchuk. From Greece likewise Lindermayer records it; from Sicily Malherbe notes it; and in Malta Mr. Wright met with it. All the year round it is found in Sardinia, but is most numerous in winter (*Brooke*). In Spain it is found in suitable localities throughout the country, and is abundant, writes Mr. Saunders, in the Cotos of Doñana. In Andalucia it is not so common as other Herons (*Irbis*), and in Portugal it is not very plentiful. Further north in Europe it has been recorded from Dalmatia and from Hungary; and I observe that recently Messrs. Danford and Harvie Brown met with it in Transylvania.

Lastly, as regards Africa, it is not uncommon in Morocco, migrating north, according to Favier, in April and returning in September; it is also found in Algeria, is plentiful in Tripoli, and is abundant in Egypt and Nubia throughout the year; whilst in Abyssinia, as well as all along the Nile and its tributaries, Von Heuglin met with it, and in July and August observed it on the shores of the Red Sea. Further south Capt. Sperling observed it at Zanzibar and Mozambique. In South Africa it is resident, frequenting the neighbourhood of Cape Town both in winter and summer; in Damara Land and Great Namaqualand it is scarce and very local; but it is, says Mr. Andersson, pretty common on the rivers flowing into and out of Lake Ngami. Further

north it is recorded from Angola and Benguela, from the Gold Coast and Senegambia, and has likewise been shot in the Canaries. To the Azores it is also a visitor, as Mr. Du Cane Godman saw specimens when there which had been shot on the island of Terceira.

Habits.—I have generally observed this very graceful Egret in pairs or alone, and have noticed it when not breeding more about brackish lagoons and backwaters than the last species. It is often found watching for fish along the courses of streams or gutters intersecting the ooze on the shores of the salt lagoons in the north of Ceylon, and will frequently allow itself to be approached within gunshot. Its flight is, like that of most Egrets, very leisurely performed; and when on the wing, with its head drawn back and its legs stretched out, it loses the elegant appearance which it has when standing by the side of water. It wades knee deep about the tidal flats of salt lakes, and catches quantities of fish in this manner. Layard observes that he found multitudes of small aquatic shells in the stomachs of those he shot at Cape Town; but its principal food consists of fish, twenty-five of which, Von Heuglin relates, he took from the stomach of one example.

Nidification.—The breeding-time of this species in Ceylon is the same as that of other Egrets, from December until March. In the latter month I found it nesting near Tissa Maha Rama, and in December and January near Trincomalic. I have also received eggs from Mr. Parker taken at Nikaweratiya in December. It builds in company with *H. alba*, from six to a dozen nests being sometimes constructed on one large thorny tree standing in the middle of a flooded tank. They are platforms of sticks, either placed at the horizontal bifurcation of two limbs, or near the top of the tree on smaller branches. The eggs are three or four in number, moderately smooth in texture, and of the same colour as those of the last species, viz. pale sea-green; some are rather pointed at both ends. They are smaller than the eggs of *H. intermedia*. Two examples taken near Trincomalie measure 1.82 by 1.26 and 1.74 by 1.27 inch. The young perch readily on the branches near the nests before they can fly, but often fall into the water, and are invariably snapped up by the crocodiles which infest the tanks of Ceylon. Indeed I have had an old bird (winged by my shot) taken away from me (as I was wading through the water to take it from the fork of a tree in which it had perched) by one of these brutes, which, seeing the bird was wounded, jumped out of the water about two feet, seized it by the leg, and dragged it under! In India the nesting-time in the north is from July to August, and in the south December and January. Mr. Hume states that very pale bluish-white varieties are common among the eggs of this species. In India they vary from 1.6 to 1.85 inch in length, and from 1.25 to 1.38 in breadth.

Subgenus BUBULCUS*.

Bill short, rather stout, and sensibly curved near the tip; naral groove deep.

* Scarcely separable from *Herodias* in point of structure, but differs markedly enough in habits to form a *subgenus*.

BUBULCUS COROMANDUS.

(THE CATTLE-EGRET.)

Cancroma coromanda, Bodd. Tabl. Pl. Enl. 54 (1783).

Ardea caboga, Franklin, P. Z. S. 1830-31, p. 124.

Herodias bubulcus (Sav.), *apud* Blyth, Cat. B. Mus. A. S. B. p. 280 (1849).

Ardea bubulcus (Sav.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111.

Buphus coromandus (Bodd.), Jerdon, B. of Ind. iii. p. 749 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1874, p. 30, et 1875, p. 276.

Bubulcus coromandus (Bodd.), Hume, Str. Feath. 1874, p. 309, et 1879 (List B. of Ind.), p. 114; Salvadori, Uccelli di Borneo, p. 350 (1874); David & Oust. Ois. de la Chine, p. 441 (1877).

Ardea coromanda (Bodd.), Hume, Nests and Eggs, iii. p. 618 (1875).

Le Crabier de Coromandel, Buff. Hist. Nat., Pl. Enl. 910; *Garde-bœuf de Coromandel*, French; *Cattle-Heron*, Europeans. *Doria bagla*, *Gai bagla*, Hind.; *Samti konga*, Telugu; *Kantal chilik*, Java; *Sweko-puti*, lit. "White Heron," Celebes (Meyer); *Huni koku*, lit. "Tick-Heron," Ceylonese Tamils.

Gehri-koka, lit. "Cattle-Heron," Sinhalese.

Adult male and female (Ceylon). Length 19.5 to 20.2 inches; wing 9.3 to 9.75; tail 3.4; tarsus 3.3 to 3.5; bare tibia 1.5; middle toe 2.4, claw (straight) 0.7; bill to gape 2.9 to 3.1, at front 2.3 to 2.45. Middle claw highly pectinated.

Adults. (Nepal) Length 19.5 to 21.7 inches; wing 9.5 to 10.5; tail 3.4 to 4.0; tarsus 3.0 to 3.5; bare tibia 1.4 to 1.8; bill from gape 2.8 to 3.1 (*Scully*). (Irrawaddy) Length 19.2 to 20.2; wing 9.3 to 9.9; tarsus 3.3 to 3.7; bill from gape 3.4 to 3.45 (*Armstrong*). (Amoy) Wing 9.5 to 10.0 inches; tail 3.2; bare tibia 1.4; tarsus 3.4; bill to gape 2.9.

Summer plumage (Ceylon). Iris pale golden yellow; bill, loreal skin, and eyelid yellow; loreal skin tinged with greenish; tarsi and feet black; tibia yellow; soles greenish yellow.

Feathers of the head, neck, and chest glistening reddish golden, the white bases on the throat and neck showing, but not so on the head and crest, which latter is 2 inches in length and somewhat stiff; chin white; down the centre of the fore neck a dividing white streak; upper back and lengthened "decomposed" plumes reaching nearly to the end of the tail sandy golden yellow; the upper part of the interscapular region and the lower part of the hind neck almost white; rest of the plumage white; abdomen and under tail-coverts slightly tinged with buff.

Both pectoral and flank "powder-down tracts" are highly developed in this Egret; they are white, buff at the base.

Non-breeding plumage (Ceylon). Iris, bill, and legs as in summer dress, except that the hue of the bill is not so bright and the tibiae are black.

Entire plumage white; a slight wash of golden buff on the crown and lower part of the fore neck; the back also tinged with buff; occipital feathers not lengthened, and the dorsal train wanting. The amount of buff on the forehead and neck is variable in individuals.

Young. Covered with "long, coarse, golden-yellow and hair-like feathers" (*Meyer*).

Obs. The yellow summer plumage appears to be more highly developed in some individuals than in others. An example from Amoy, before me, has the golden yellow descending over the breast; other specimens are similar to the one above described, and a Sumatran example is identical with Ceylonese skins.

A near ally of this species is the African Cattle-Egret, *B. russata*, Wagler (*Ardea ibis*, Hasselq.), a well-known bird in Egypt, and extending into parts of South-west Asia. It differs from our bird in the much paler or less golden colour of the head and neck in summer plumage, and in the more feathered tibia. The wing measurement, according to Von Heugliu, is 8 inches 10 lines (8·84) to 9 inches 3 lines (9·25), bare tibia 1·0.

Distribution.—This well-known Heron is spread throughout all the low country of Ceylon, being quite the most abundant of the white Egrets of the island. It is particularly common all through the Western Province, the more open parts of the North-western Province, and similar districts in the well-watered and cultivated parts of the south. It is found in suitable places throughout the south-eastern districts both on the sea-board and in the interior; but it was omitted accidentally from my list of the birds of this region in the 'Ibis' for 1875. In the Eastern Province and in the neighbourhood of Trincomalie it is, I think, not so numerous as in the west of the island. Further north it is perhaps more plentiful, and I have always met with it at tanks, village pools, and open tracts of country in which there was water all through the northern forests. It ascends into the valleys of the Kandy country, and is occasionally, I understand, seen in the Fort-Macdonald district; but I do not know that it has ever been noticed at Nuwara Eliya.

It is very common all throughout India, being found at the base of the southern hills, in the Deccan, and all throughout the north-western region, composed of Sindh, Rajpootana, Guzerat, Kutch, and Kattiawar, frequenting those districts which are well watered; it is found in the Central Provinces and all through Chota Nagpur and in the districts at the foot of the Rajmehar hills; about Calcutta it is tolerably plentiful, and in Furreedpore is common. In these parts, as far as published data go to prove, it is more or less resident, collecting in certain localities to breed. It is a permanent resident also in the valley of Nepal, being common there from the beginning of March until the end of November; in the Terai and adjoining places it is abundant in December (*Scully*). In Upper Pegu it is common at Thayetmyo; but in the intermediate district of Cachar I find no mention of its occurrence. In the Irrawaddy delta Dr. Armstrong found it very abundant; and further south, in Tenasserim, Mr. Hume says it is plentiful everywhere, especially where there are cattle. In the Andamans it is common, but was not observed by Mr. Davison in the Nicobars, though he met with it in Sumatra at Achén. To the eastward of Burmah it ranges into Cochin China and the south of China, as also to the island of Formosa in the summer. In the Celestial Empire, according to Père David, it extends only as far north as the river Yang-tze-kiang. It has been recorded from Luzon in the Philippines; and in the Malay archipelago it inhabits Java, Borneo (Sarawak, Brunei), Timor, Batchian, and Celebes, in the latter of which islands it appears to be numerous.

Habits.—This Egret frequents pasture-land, paddy-fields, the borders of tanks, and edges of swamps; and from its great abundance and singular habit of attending on cattle and frequently perching on their backs is familiar to all Europeans who reside in or have visited Ceylon. In the Western Province it is the one bird that wanders where one will in the cultivated districts, one is sure to meet with. Along the railway from Colombo to Rambukkana it is sure to be seen (except during the months when it has retired to secluded spots to breed), standing sometimes two or three in a field, attending one or two oxen, or grouped in a little flock near a pond in which several unwieldy buffaloes are half immersed, taking a noonday siesta. On their broad backs probably stand one or two Egrets, like sentinels on watch-towers, their presence being regarded by the buffaloes with complacency and evident satisfaction, for the attractions of the birds are the quantity of flies and insects which tease the animals, and the ticks which infest their skins, on both of which these Egrets largely subsist. The Cattle-Egret is a graceful bird when in an attitude of repose, standing with its neck curved, and its body, which is proportionate to the moderate length of its legs, presenting a graceful outline against the green fields. It perches much on trees, and at evening time collects in flocks, which fly moderately close together, and proceed with steady and rather slow strokes, on their way over the surrounding jungle to some common roosting-place. It roosts in trees, and is abroad very early in the morning, flying away at once to far-distant feeding-grounds. This bird feeds on grasshoppers, beetles, bugs (*Hemiptera*), locusts, and flies, also on frogs and crustacea, but rarely, I think, on fish; it may sometimes be seen following native cultivators when they are hoeing the fields, its snow-white plumage contrasting beautifully with the dark soil. With regard to its partiality to grasshoppers, Mr. Ball writes:—"One which I shot early in the day on the 24th of March, 1867, contained in

its stomach 60 whole grasshoppers and other orthopterous insects, besides which there was an equal bulk of some digested heads and legs, so that this bird had breakfasted on about 120 grasshoppers." I have on more than one occasion seen this Egret picking ticks from the legs of cattle; but I have not observed it doing so when standing on their backs, as Crows commonly do; and this latter position seems to be one of rest merely. It is an extremely silent bird as a rule; but during the breeding-season it becomes noisy, and constantly utters its cry (*quak*), which is perhaps peculiar to it when nesting.

Nidification.—Layard found this Egret breeding with the larger species in May at a tank near Tangalle. The nests are commenced or renewed about the beginning of April, and probably earlier in localities where these large colonies commence at the beginning of the year to breed. At the several heronries which I have visited I have not had the good fortune to find the Cattle-Egret nesting, and I rather incline to the opinion that it nests by itself as a rule. The nests are built on trees in the water, and are platforms of sticks lined with a few roots or creeper-tendrils. The eggs are four or five in number, and are, says Mr. Hume, to be distinguished from those of all other Herons by their very pale colour, being white, with a faint green tinge. They are broad ovals in shape. In length they vary from 1.6 to 1.85 inch, and in breadth from 1.22 to 1.4.

The breeding-season in North India lasts from June until August; but in Southern India it is in November and December.

Genus ARDEOLA.

Bill stout at the base, much pointed, the gonys pronounced, commissure nearly straight. Wing with the 1st quill almost equal to the 2nd, which is the longest. Tail very short. Legs short; tibia feathered more than in the preceding groups. Tarsal scales narrow and rectangular. Middle toe slightly shorter than the tarsus; inner toe slightly shorter than the outer; hind toe stout.

Plumage of the neck elongated; head crested and dorsal plumes decomposed and elongated in the breeding-season, also a marked difference in the plumage at that time.

ARDEOLA GRAYI.

(THE POND-HERON.)

Ardea grayii, Sykes, P. Z. S. 1832, p. 158.

Ardeola leucoptera (Bodd.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 112; Jerdon, B. of Ind. iii. p. 751 (1864); Legge, Ibis, 1874, p. 30.

Ardeola grayi (Sykes), Holdsw. P. Z. S. 1872, p. 478; Hume, Nests and Eggs, iii. p. 619 (1875); Legge, Ibis, 1875, p. 276; Hume, Str. Feath. 1876, p. 467, et 1879, p. 114 (List B. of Ind.); Scully, *t. c.* p. 361.

Indian Squacco Heron, *Marone-backed Heron*, Sykes; *Paddy-bird*, Europeans in India and Ceylon. *Andhe bagla*, *Kani bagla*, Hind.; *Konch bogla*, Beng.; *Gudi kongra*, Telugu, lit. "Blind Heron;" *Nuli madiyan*, Tamul, lit. "Blind idiot."

Kana-koka, Sinhalese.

Adult male and female (Ceylon). Length 18.0 to 18.5 inches; wing 7.75 to 8.3; tail 2.75 to 3.2; tarsus 2.05 to 2.1; middle toe 1.85 to 2.0, its claw 0.45; hind toe 0.9 to 1.0; bill to gape 2.9 to 3.0, at front 2.3. Pectination of the middle claw fine and shallow.—*Male* (Irrawaddy). Length 15.2; wing 8.65; tail from vent 2.9; tarsus 2.3; bill from gape 3.2.—*Females*. Length 14.25 to 14.6; wing 7.55 to 7.6; tarsus 1.9 to 2.2; bill from gape 3.1 to 3.15 (*Armstrong*). [The "length" in these cases appears to be given exclusive of the bill.]—*Adults* (Nepal). Length 17.5 to 20.7; wing 7.5 to 8.7; tail 2.8 to 3.1; bill from gape 2.93 to 3.2 (*Scully*).

Breeding-plumage. Iris golden yellow; bill with the terminal portion black, bluish at the base and on the culmen; sides of both mandibles at the middle yellow; legs and feet greenish, the tarsus pervaded with grey and the joints bluish.

Head and neck greyish yellow, the long decomposed feathers at the lower part of neck whitish, and their bases brownish grey; head tinged with ashy; an occipital crest of narrow white feathers, attaining a length of $4\frac{1}{2}$ inches; upper part of back and long decomposed scapular feathers dark maroon, with an ashy hue in parts; rest of the plumage white. Some specimens have the head more ashy than others; and the occipital crest varies in length. The dorsal plumes reach beyond the tail.

Non-breeding dress. Bill with the upper mandible, gape, and tip of lower blackish, lower mandible yellowish; legs and feet greenish yellow; loreal skin yellow.

Head and upper part of the hind neck, as also two broad lateral stripes on the fore neck, black-brown, with golden-yellow central streaks, increasing in width on the lower part of the hind neck, leaving the margins of the feathers paler brown; crest wanting; face and ear-coverts golden buff, striped with brown; chin and gorge pure white, with a stripe on each side of the chin; upper back, scapulars, and terminal half of tertials glossy cinereous brown; a yellowish streak down the centres of the scapulars, but some of the underlying feathers pure white; wings, lower back, rump, tail, and under surface white; the greater wing-coverts washed with brownish buff; lower fore-neck feathers white at the base and centres, passing into buff near the tips, near which are lateral stripes of brown, paler than those on the upper fore neck.

Young. In nestling plumage the iris is yellow, bill fleshy red, and the legs and feet pea-green. The plumage much resembles the non-breeding dress of the adult: head not so dark, the striae more fulvous; sides of the neck buff, the feathers brownish at the sides; fore neck and throat white, with drop-shaped marks of brown; brown of the scapulars and back more rufescent than in the adult; wing-coverts buff, washed with brownish; quills and tail tipped with the same, increasing on the outer primaries, the first of which is all brown, except on the basal half of the inner webs.

Obs. Specimens in winter plumage from Futtehghur correspond with mine from Ceylon, except that the dark stripes on the fore neck are somewhat tinged with vinous; this may be an individual peculiarity, and the bird is so scarce

in English collections (though so abundant in India) that I have not had an opportunity of comparing many Indian specimens. A *male* measures—wing 8·4, tarsus 2·3, middle toe (with claw) 2·4, bill to gape 3·0 inches. In Bengal the breeding-plumage is acquired in May and worn until October (*Cripps*).

Ardeola prasinoscelsis, Swinhoe (which is perhaps the same as *leucoptera**, Bodd.), inhabiting China and also the Malay peninsula and Tenasserim, is the Eastern representative of the present species. It has, in breeding-plumage, the head and neck deep chestnut, darkening into cinnamon-rufous on the chest; the interscapular region and dorsal plumes blackish slate, the scapulars washed with golden; throat and rest of plumage white. A Chinese specimen measures—wing 9·2 inches, tarsus 2·5, bill to gape 3·2; in *non-breeding plumage*, according to Mr. Hume, it resembles *A. grayi*, except that occasionally it has a crest of buff feathers with black edges, and it may always be distinguished by its stouter bill. Legs and feet orange-yellow, with a pinkish tinge.

Another species, *A. speciosa*, inhabiting the Malay archipelago, is allied to the last-mentioned, having the dark parts of the plumage in the breeding-season ferruginous of various shades and purplish black with a hoary shade, the latter being the colour of the back. It is a smaller bird than the latter, an example from Celebes measuring, according to Mr. Hume—wing 7·7, tarsus 2·35, bill at front 2·5. A further species of Squacco Heron is *A. comata* from Egypt, which has the crest white with black edges, head and neck brownish buff, and the back yellowish brown, shaded with purple; legs olive: wing 8·5 (*Shelley*).

Distribution.—This Heron is extraordinarily abundant in Ceylon, being found at every pool, river, and stream, and in all paddy-fields in the cultivated districts of the low country, and by both large and village tanks and at most water-holes in the forest-districts of the island. In the western and southern parts, where paddy-cultivation abounds, it is, of course, most numerous, extending in the Western Province to the base of the hills and up into the valleys of the Kandyan country, wherever the “terraced” fields of the natives adorn the sides of the mountains. It is found about Badulla, and, I believe, is sometimes seen in the Fort-Macdonald district; it likewise affects paddy-fields about the base of the southern hills and ascends into their valleys.

In India it is, as in Ceylon, extremely numerous, being, as Jerdon says, found at the side of every river, tank, ditch, and pool throughout the country. Consulting the writings of recent observers in ‘Stray Feathers,’ I find it recorded as common everywhere in Southern Travancore (*Bourdillon*), also about the base of the Palanis (*Fairbank*), throughout the Deccan, where it was first described from by Sykes, common in all parts of Chota Nagpur, and recorded by Mr. Ball, as regards this region, from Bardwan, Manbhum, Lohardugga, Orissa, Nowagarh, and Karial. In the North-west Provinces it is equally plentiful, and further west is found in Rajpootana, including the State of Jodhpur (where it clings to the pools in the severest droughts as long as the water lasts), and in Guzerat, Sindh, Kutch, and Kattiawar. At the Sambhur Lake, Mr. Adam found it not very plentiful. Turning eastwards again, we find it abundant in Furrcepore, also in Cachar, and common in Upper Pegu at Thayetmyo; further south Dr. Armstrong met with it throughout the Irrawaddy delta in all suitable places, and over all the low country of the Province of Tenasserim it is equally plentifully distributed. Beyond this region towards Malacca it is entirely replaced by *A. prasinoscelsis*. Leaving the mainland I find that it is recorded by Mr. Davison as common at Pt. Blair; but he believes it to be migratory to the Andamans. Mr. Hume observed it at Barren Island; but at the Nicobars it has not been noticed. Westward of India Mr. Hume met with it at the Laccadives, observing it numerous at Cardamum and Amini.

Habits.—As above remarked, this Pond-Heron frequents all kinds of freshwater situations, from the little pond in the native compound, or secluded water-hole in the dry timber-forest or arid maritime scrubs, to the extensive tank or wide-spreading paddy-field. It, however, does not despise salt-water fish; and solitary examples may frequently be seen in the sardine-season perched on stones and rocks, even at some little distance from the shore, where the water is calm: two birds were always to be seen in such situations along the coast of the Fort at Trincomalee, and when tired with watching at one rock (they never used to catch much in these places) they would fly leisurely on to another. At night the little colony which frequented the

* This name was applied to Buffon's figure (Pl. Enl. 911) of a young bird; and as the young of the Indian and Chinese species are alike, it is not possible to say with certainty which of the two Buffon intended to portray.

vicinity of the fort roosted in the trees in the "Gun Park," retiring some time before dark, and perching tamely on the branches close to the road. It is proverbial in India for its tameness; and it manifests an equally confiding disposition in Ceylon, forbearing to fly up until approached very close, and then merely shifting its ground but slightly, or alighting on a fence, stump, or branch of a tree close at hand. Its tame disposition has earned for it in India the opprobrious names mentioned in the synonymy; but in Ceylon its Sinhalese name has reference only to its flesh, which the natives consider good eating. When watching motionless by a pool, often standing up to its knees among grass, with its head drawn in, its brown back towards the spectator, and its white wings concealed, it is astonishing how very unobservable it is; but the instant it spreads out its wings to take flight, an attractive white bird catches the eye with almost startling effect, owing to its previous invisibility. The Tamuls, according to Layard, have a proverb that, like this Heron, the deceitful man only occasionally shows himself in his true colours. When startled suddenly it rises with a short hoarse *ko-ake*, which is almost the only note one ever hears, except at the breeding-time. It rarely perches on lofty trees, preferring stumps, branches of fallen trees near water, stakes, and fences; and, except when going off to roost, it rarely takes long flights; the movements of its wings consist of quick flaps, unlike that of other Herons. Frogs are its favourite food; but it likewise catches water-beetles, crabs, and fish, moderately large examples of which I have taken from the stomach of one shot on the Colombo Lake.

Nidification.—The Paddy-bird breeds in May and June in the south of the island; it retires to unfrequented localities to nest, sometimes to an island in a lake. In such a situation on the Kogalla Lake, near Galle, I once found a large colony of Pond-Herons breeding in a grove of Kadool trees (*Rhizophora mucronata*) with which the islet was girt. The nests were built in the forks of branches, and were platforms of sticks and twigs without any lining, measuring from 8 inches to a foot in diameter. In some trees there were as many as five or six nests. The eggs were from two to four in number; but the average number in a clutch was four; they varied in shape, some being equally rounded at both ends, others somewhat pointed at the small end. The colour is pale bluish green, and the average size of a number of specimens is 1.57 by 1.18 inch. Many nests contained young; but, singular to say, only one; and what had become of the others I cannot say. They scrambled out of the nests and crawled along the branches with considerable agility, holding on with their claws when seized.

In Upper India, writes Mr. Hume, this species breeds in July and August, but in the south in December. Mr. Oates says that in Burmah, occasionally, it apparently nests in reeds.

Genus BUTORIDES.

Bill quite straight, the terminal portion acute; under mandible markedly slender, but with the gonys pronounced. Wings pointed, the 1st and 2nd quills subequal and longest; tertials equal to the primaries. Tibia more feathered than in the last. Tarsus short; tarsal scales transverse, but polygonal or angulated at the sides. Toes short.

Head crested; plumage of the neck elongated; scapulars lanceolate and not decomposed. No change of plumage in the breeding-season. Of semi-nocturnal habit.

BUTORIDES JAVANICA.

(THE GREEN BITTERN.)

Ardea javanica, Horsf. Trans. Linn. Soc. xiii. p. 190 (1821).

Butorides javanica (Horsf.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Jerdon, B. of Ind. iii. p. 752 (1864); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Holdsw. P. Z. S. 1872, p. 478; Hume, Str. Feath. 1874, p. 310, et 1879, p. 114 (List B. of Ind.); Salvadori, Uccelli di Born. p. 351 (1874); Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 620 (1875); David & Oust. Ois. de la Chine, p. 442 (1877).

Javanese Heron. *Burong Jukoyan*, Borneo; *Puchong*, Malay; *Burong Puchong*, Java (Horsf.); *Kancha bagla*, Hind.; *Kana bogla*, Bengal.; *Doshi-koku*, Tamil; *Sweko-itam*, lit. "Black Heron," Celebes (Meyer).

Adult male and female. (Ceylon) Length 16.75 to 17.5 inches; wing 6.7 to 6.9; tail 2.2 to 2.4; tarsus 1.75 to 1.9; middle toe 1.8, claw (straight) 0.4; bill to gape 2.9 to 3.1, at front 2.3 to 2.4; pectinations of middle claw deep and fine.—*Male* (Andamans). Length 16.75; wing 6.75; tail 2.5; tarsus 3.0; bill from gape 3.1, at front 2.45; weight about 6 oz. (Hume).—*Males* (Furreehpore). Wing 6.75 to 7.0; tarsus 1.83 to 2.0; bill from gape 3.35 to 3.43.—*Female*. Wing 6.75; bill from gape 3.58; weight 6.62 oz. (Cripps).—*Adult* (China). Wing 7.2; tarsus 1.9; bill at front 2.5.—*Male* (Borneo). Wing 7.0; bill at front 2.3.—*Adult* (Java). Wing 6.7; bill at front 2.4. Iris yellow or reddish yellow, with a brown outer circle; bill, upper mandible and edge of lower black, lower mandible greenish; loreal and orbital region greenish yellow; legs and feet dull green anteriorly, posteriorly and the soles yellow, claws brown.

Top of the head, crest (2½ in. long), and a facial patch, divided and bounded beneath by buff-white stripes, black, glossed (except on the cheeks) with green; back and sides of neck, passing below the cheek to the under mandible, dusky bluish ashy, tinged with brownish and shaded at the shoulders with reddish ashy; back cinereous, tinged with metallic green and pervaded with reddish ashy on the rump; scapulars, wing-coverts, and tail metallic green, pervaded with slaty on the tail and pale grey (in some lights) on the elongated scapulars; least wing-coverts margined with rufous-brown; the succeeding rows and the tertials with clearly defined edges of fulvous yellow; quills slate-colour, tipped, except the outer primaries, with white; chin and centre of fore neck white, interrupted at the middle of the throat and washed on the lower part with pale fulvous or reddish brownish, the feathers on the upper part having brownish tips; beneath slaty, washed with brownish fulvous on the belly and thigh-coverts; under tail-coverts with dark subterminal patches; axillaries and under wing slate-grey; the edge beneath the metacarpus buffy white. The powder-down tracts in this species are extensive.

Very old birds are said by Mr. Hume to have no pale margins to any of the wing-feathers, which are rich metallic green; there is no white stripe down the centre of the throat, and the underparts have a stronger reddish tinge than in ordinary adults.

Young. Birds of the year have the soft parts much as in the adult.

Head and crest ashy black, slightly glossed with green, and with white mesial stripes; hind neck and its sides, with the back, brownish ashy, the sides of the neck with broad whitish mesial stripes; wings and tail dingy metallic green, the scapulars and wing-coverts with triangular terminal white spots, the coverts with broader but not so sharply defined edgings as in the adult; scapulars not lanceolate; quills dusky slaty, with terminal white spots expanding into an edging on the tip of the outer web; cheeks blackish, striated with whitish, the lower cheek-stripe whiter than in the adult, and the sides of the gorge striated; chin, centre of throat, and fore neck with the breast and belly white, the middle of the fore neck with deep brown, and the lower part with lighter brown lateral patches to the feathers; sides of the chest dashed with light brown, the tips of the feathers buff-white.

Birds not fully adult may be known by having the centre of the throat dashed with dark brown, the black cheek-patch not clearly defined, the sides of the chin black, and the least wing-coverts more conspicuously edged than in the normal stage. This is probably the phase of the second year.

Obs. Chinese specimens have the dorsal plumes paler or more ashy than in mine from Ceylon; and the margins of all that I have examined are pure white. Adolescent examples from Java exhibit the same characters, as regards stripe down the throat and black streak on each side of the chin, as I have above noticed are present in Ceylonese. The Chinese race seems to be larger than the Indian; but published data and the measurements of specimens I have seen from Java, Andamans, India, and Ceylon correspond pretty well with one another.

B. macrorhyncha, Gould, from China and Australia, appears to resemble our bird, but is longer in wing and bill. A specimen which I have examined in the Swinhoe collection, measuring in the wing 8.2 inches, is apparently of this species.

Distribution.—This handsome little Bittern is abundant in the north and east of the island, and is likewise numerous on the west coast, in the cool season particularly. At that time I have frequently met with it on the Colombo Lake and lurking about the banks of various streams between Negombo and Galle. Throughout the year it is to be met with near Kotte and similar places on the west coast; but, as a rule, it is not often seen after April in that part of the island. It is to be found in the south-eastern region in suitable places, and on the margins of the Batticaloa Lake it is common, and, I imagine, resident throughout the year. In the Trincomalie district I noticed it more frequently during the north-east monsoon than between April and October. On the coast to the north of that place it is common about salt lakes or lagoons which are lined with low trees and bushes growing between high- and low-water marks. At Jaffna Layard speaks of it as being abundant. It is found throughout the year at Aripu, according to Mr. Holdsworth; and at tanks in the North-central and North-western Provinces Mr. Parker has met with it.

In India it appears, from published data, to be more generally distributed than the Cinnamon or Black Bitterns. I find Mr. Bourdillon recording it from the Travancore hills as a winter visitor, affecting mountain-streams up to 2000 feet, Messrs. Davidson and Wenden writing that it is common at Satara, and Mr. Fairbank that it is found at Mahabaleshwar and in the hills west of the Deccan. It is commonly distributed throughout Sindh, Guzerat, Kutch, Kattiawar, and portions of Rajpootana, wherever there are tanks, marshes, and canals. On the Eastern Narra it has been found breeding; and near Kurraehce harbour Capt. Butler has met with it. From the districts thus mentioned across to Calcutta it is pretty generally distributed, and in Chota Nagpur and some parts of the central provinces it is common, according to Mr. Ball. In Furreedpore and North-east Cachar the same is the case; but in the immediate vicinity of Calcutta it is rare. In Upper Pegu Mr. Oates found it on the Eugmah swamps; and further south in Tenasserim it is to be met with, says Mr. Hume, on every stream. It has been procured at Malacca; and in the Andamans and Nicobars it is very common, breeding there, according to Mr. Davison, in May. It likewise occurs at the Laccadives, where Mr. Hume met with it on the island of Cardamum. Turning eastward now we find it extending to Cochin China and the south of China in the summer for breeding purposes; and, according to Messrs. David and Oustalet, it ranges north to Mantchura, Amoor Land, and Japan; but it seems doubtful whether it is this species or the larger-billed form, *B. macrorhyncha*, which is found in these northern regions. Schrenk gives the wing of an Amoor-river example as 7.5 inches, which would appear to refer to our bird. In the Philippines the present species has recently been found in Luzon; and it is distributed throughout many of the Malay islands from Borneo to Sumatra, in which latter island it occurs at Achecn in the extreme west and in Lampong at the eastern extremity. From Java it was first described by Horsfield; and in Borneo it has been procured at Banjermassing, in Sarawak, at Sibul, and in the adjacent island of Labuan; from Amboyna, Celebes, Ceram, Halmehera, Morotai, Timor, Flores, Aru Islands, and New Guinea it has been recorded; and I observe from Herr Meyer's notes that it is not uncommon in Celebes, breeding there. Along the northern sea-board of Australia from Port Darwin it is found as far south as New South Wales; and eastward it extends to New Caledonia, the Society Islands, and Fiji.

Habits.—This Bittern is not by any means wholly nocturnal, as on dull days it may be seen out feeding in exposed situations; and wherever there are overhanging bushes on the banks of rivers or the borders of lakes it may constantly be seen lurking about, watching, in a lethargic sort of manner, for fish and frogs. It will stand for a long time in an attitude of repose, with its neck drawn in, now and then twisting its head awry when any thing attracts its attention; then perhaps stalking along with measured steps, thrusting its head out, gazing into the water with apparent stupidity until its sharp eye catches sight of a fish or frog,

which is instantly pierced with an unerring aim and quickness of action that the beholder would never have thought it capable of. I have seen it standing early in the afternoon by the water of the Battialoa Lake, within five yards of the highroad, with an air of the most utter preoccupation, quite regardless of the passing vehicles and seemingly of any thing else in this world; but beneath this eloak of apathy lurks a watchful spirit; and a keen eye, though it cannot be observed, is surveying the finny prospect around it! At sundown it becomes active and flies about, seeking hunting-grounds for the night. Herr Meyer, who observed it at the Lake of Tondano, Celebes, says it "sits much on a twig over or near water, bent together, but eagerly looking for food and suddenly rushing down on a fish or crab;" he also remarks that it feeds on eggs of freshwater fishes, especially of *Ophiocephalus striatus*, which strong fish often attacks the bird and hinders it from devouring the eggs (!). This writer likens the call to *qua qua*, like that of a Crow. Occasionally this Bittern may be seen on the seashore; and Captain Wade-Dalton informs me that he shot one on the rocks near the Galle lighthouse.

Nidification.—The Green Bittern breeds in India from May until August. In May its nest has been found in Sindh; in July on the Jumna canal; in August in the Etawah and Muttra districts. I am not aware that its eggs have ever been found in Ceylon; but, judging by the young birds being about in first plumage at the end of the year, the breeding-time must be similar to that in India. The nest is usually placed near the water among reeds and rushes, or on vegetation growing in water. One which Mr. Hume found "was partly supported on the twigs of a dead sunken Babool branch, and partly on rushes bent down over this, forming a little platform about 2 feet above the water's edge. It was a small stick-nest, perhaps 8 inches in diameter." Captain G. Marshall found a nest on a Keekur-tree at the edge of a jheel, on a horizontal branch about 20 feet from the ground, and describes it as a slight structure of sticks.

The eggs are three in number, elongated ovals, pointed at both ends; greenish white, and vary in length from "1.59 to 1.64 inch, and in breadth from 1.19 to 1.23." The nest which Captain Marshall found contained three young ones, which were nearly fledged but unable to fly, and erept about among the thorny branches.

Genus ARDETTA.

Bill much as in *Butorides*, deeper at the base, and with the culmen flat at the forehead; gonys short; narial groove capacious. Legs short; tibia feathered down to the knee; tarsus scarcely longer than the middle toe and claw.

Head with a short crest; neck-feathers elongated; back of the neck bare; scapulars normal. Of nocturnal habit.

ARDETTA SINENSIS.

(THE EASTERN LITTLE BITTERN.)

Ardea sinensis, Gm. Syst. Nat. i. p. 642 (1788); Gray & Hardwicke, Ill. Ind. Zool. i. pl. 66. fig. 2 (1830-34); Salvadori, Uccelli di Born. p. 354 (1874); Hume, Nests and Eggs, iii. p. 673 (1875).

Ardea lepida, Horsf. Trans. Linn. Soc. xiii. p. 90 (1821).

Ardetta sinensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 282 (1849); Layard & Kelaart, Prodromus, Cat. App. p. 61 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Jerdon, B. of Ind. iii. p. 755 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1875, p. 404; David & Oustalet, Ois. de la Chine, p. 448 (1877); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.); Doig, *t. c.* p. 378.

Chinese Heron, Lath.; *Yellow Bittern*, Jerdon. *Jun bogla*, Bengal.; *Bambangan*, Java (Horsf.); *Mannal Nary*, Ceylonese Tamils.

Metti korowaka, Sinhalese.

Adult male and female (Ceylon). Length 14.4 to 14.75 inches; wing 5.2 to 5.4; tail 1.8 to 1.9; middle toe and claw 1.95 to 2.0; bill to gape 2.4 to 2.9, at front 2.0 to 2.2; expanse 21.0. Middle claw finely pectinated.

Male (Furreedpore). Length 17.75 inches; wing 5.53; bill at front 2.16; weight 3.37 oz. (*Cripps*).—*Female* (Andamans). Length 15.25 inches; wing 5.3; bill from gape 2.75; weight 6 oz. (*Hume*).—*Five males* (China). Wing 5.1 to 5.3 inches; tarsus 1.7 to 1.9; bill at front 2.05 to 2.2. *Three females*. Wing 4.7 to 4.9 inches; bill at front 2.0 to 2.1.—*Female* (Flores). Wing 4.8 inches; bill at front 2.05.

Iris golden yellow; orbital and loreal skin and gape greenish, with a dark line above to the nostril; bill, culmen blackish brown, the margin of upper mandible and the lower yellowish; legs yellowish, marked with green on the joints and sides of tarsus; feet greenish dusky above; claws dark brown.

(Ceylon). Forehead, head, and crest black, with a green lustre; neck and throat light fulvous yellow, the chin paler, and the sides of the neck, face, and sides of head shading off into reddish cinnamon-colour, deepest at the tips of the elongated feathers; back and scapulars pale glossy brown, with a slight green lustre and a dark wash down the centre; wing-coverts sandy or paler brown than the back; quills, primary-coverts, winglet, and tail blackish slate; upper tail-coverts bluish ashy; pectoral plumes black, with broad fulvous-yellow edgings; breast, belly, and under tail-coverts fulvous white, darkening to fulvous at the sides of the breast and on the flanks; under wing-coverts and edge of wing white.

Young. Birds of the year have the soft parts as in the adult.

Centres of the head and crest-feathers black, changing to rufous at the edges; chin and gorge white; a rufous stripe down the centre, this colour spreading over the neck on the lower part, and occupying the centres of the feathers, which are dark-shafted; terminal portion of side-neck feathers the same; back rich brown, verging into rufous on the scapulars and tertials; centres of the wing-coverts brown, and the whole deeply edged with glossy fulvous-yellow; quills, tail, and pectoral plumes much as in the adult, but the latter with broader edgings, and the hue of the primaries and secondaries not so black; the edge of the 1st quill buff, and the tips of the secondaries slightly pale.

Obs. Examples from the Andamans and Nicobars are, according to Mr. Hume, more brightly plumaged than Indian specimens. A young bird is described (Str. Feath. 1873, p. 308) as having the top of the head, back, scapulars, tertials, and lesser wing-coverts "deep cinnamon-rufous," the crown-feathers centred darker, and the margins of the back-feathers golden buff. This distribution of colour is the same as in our birds; but the tints are evidently brighter both as regards the dark and pale coloration. A series of adults from China which I have examined present no important points of difference; the colour of the back is a little browner in most, but in other points they are identical with Ceylonese birds. The well-known Little Bittern of Europe, which is also found in North-western India (Sindh), is the western representative of this species, and is larger, differing chiefly,

as regards plumage, in the colour of the back and scapulars, which is black. The head and crest are likewise black, as in our bird; throat and under surface buff. An adult before me measures—wing 5·5 inches; bill (which is proportionately shorter than in *A. sinensis*) 1·85 at front. An immature male measures 6·0 inches in the wing; bill at front 1·7.

Distribution.—This species, like the Black Bittern, is chiefly found in the damp and better watered portions of the island, rarely occurring, so far as I know, in the dry districts of the Eastern Province, and only affecting a few suitable localities in the north. From November until March it is common in the Western Province, inhabiting parts of the Colombo Lake, resorting to the “Lotus-pond” even, affecting the swamps and bushy morasses between Borella and Kotte, similar spots in the Mutturajawella swamp, scrubby islands in the Negombo Lake, reed-beds on the Panadure and Bolgodde Lakes, and similar localities along the whole western sea-board. It is occasionally seen among bushes on the rivers and streams of this part of the island and the extreme south. Here it is to be found on the Bentota, Gindurah, and Matara rivers, and further east perhaps on the Wellaway river. Near Tissa Maha Rama I have met with it, as also on the Batticaloa Lake; but in this part of the island it is, as I have remarked, apparently rare. During the south-west monsoon it disappears from the neighbourhood round Colombo, retiring probably to secluded spots for breeding purposes. Mr. Parker has seen it in the Kurunegala district, and also at Nuwara wewa and other tanks near Anaradhapura; and I have no doubt it breeds there. I have seen it near Trincomalie and in the Jaffna peninsula on the Ethelemaduvil swamp, which forms the head of the Pootoor lagoon, and is one vast bed of reeds intermingled with groves of bushes and mangroves.

In India it is found here and there throughout the peninsula, as also in the northern parts of the empire; but it does not seem to be regularly distributed. In the Deccan Messrs. Davidson and Wenden say that it is not common; and it is not included in Mr. Ball’s list of Godaveri and Ganges birds. About Calcutta and in Furreedpore it is rare; likewise in Pegu, as I find that Mr. Oates met with it but once; in Tenasserim, however, it is not uncommon to the north-west of the Sittang and in the southern half of the province. Turning to the north-west of India I find that it is a bird of irregular occurrence in Guzerat and Sindh, although very common during some seasons on the Eastern Narra, where Mr. Doig found it breeding. In this part of India the ranges of the two species of small Bittern overstep, that of *A. minuta* extending thence westwards to Europe. Turning now towards the east, we find *A. sinensis* common throughout China in the summer, breeding in great numbers near Pekin, according to Père David; a straggler to Japan, whence Mr. Blakiston has sent it to England; also to the Philippines, where Schlegel records it as occurring; rare in Formosa; and finally ranging from Sumatra and Java to Borneo, Celebes, and Flores. In the first-named island it was seen at Achcen by Mr. Davison; and in Borneo it has been procured in various localities, and among others at Bintulu in October by Mr. Everett. It is said to have been found in the Ladrone Islands, which, I conclude, must be the limit of its range to the eastward.

Habits.—This pretty little Bittern, which is the smallest of its family in India and Ceylon, affects long grass in swamps, reeds, bulrushes, and also thickets growing in marshes and morasses. It is very partial to long reeds, on which it perches quite as adroitly as a Warbler. I have seen it suddenly alight on a tall perpendicular reed-stalk, with one leg stretched down and the other abreast of the body, in exactly the same manner as an ordinary Passerine bird. It is by no means shy, and does not fly up until it is approached quite close, often preferring to seek concealment by skulking in underwood and scrub rather than by taking flight. It is very difficult to flush once it has taken to dense cover, running about on the ground, or creeping and climbing about the branches. It is much more diurnal than the Black Bittern, and on the islands in the Negombo Lake, some of which are clothed with thick, low, flat-lying brushwood, I have seen it come out to the edge of the salt water and watch for shrimps and small fish, standing motionless and peering down with outstretched neck. In the Lotus-pond at the Pettah, Colombo, I have noticed it walking on the broad leaves with as much ease as the “Water-Pheasant;” and when flushed flying round the pond, finally alighting on the tall trees in the “Racket-court” enclosure. It has a curious guttural croak, which I have heard it utter when trying to drive it out of thick scrub. The food of this species consists of frogs, fish, water-insects, worms, &c.; but it also feeds on crabs and shrimps when frequenting salt-water localities. Its flight, though performed with a quick motion of its small wings, is laboured and slow.

Nidification.—It is probable that this little Bittern breeds about the same time in Ceylon that it does in India. There I find that Mr. Doig found its nests in Sindh in May and August, and Mr. Oates in Pegu in the same month. I am not aware that the nest has ever been found in Ceylon. It builds in the centre of a clump of bulrushes or reeds, or even in a tussock of grass, according to Mr. Doig. The eggs vary from three to five in number, and, according to the last-named gentleman, are "nearly spherical in shape," and when first blown of a delicate sea-green, fading after a time almost to white. They vary from 1.15 to 1.25 inch in length, and from 0.9 to 0.95 in breadth. Mr. Oates describes his eggs as without gloss and a pale green colour, four specimens varying in length from 1.26 to 1.31 inch, and in breadth from 0.93 to 0.97. Captain Butler describes two found at Milana as long and cylindrical, white, faintly tinted with skim-milk blue.

Subgenus ARDEIRALLA*.

As in *Ardetta*, but with the tibia not feathered to the knee.

* As the very marked difference in the feathering of the tibia in the last and two following species precludes the possibility of my keeping all these in the same genus, I have retained *Ardetta* for the Eastern Little Bittern, as it is similar in all respects to *A. minuta*, the type of the genus *Ardetta*.

ARDEIRALLA FLAVICOLLIS.

(THE BLACK BITTERN.)

Ardea flavicollis, Lath. Ind. Orn. ii. p. 701 (1790); Jerd. Ill. Ind. Orn. pl. 16 (1847).

Ardetta flavicollis (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 282 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Jerdon, B. of Ind. iii. p. 753 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1874, p. 30, et 1875, p. 404; David & Oust. Ois. de la Chine, p. 446 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 483, et 1879, p. 114 (List B. of Ind.); Doig, *t. c.* p. 376.

Ardeiralla flavicollis (Lath.), Salvadori, Ucc. di Born. p. 353 (1874).

Yellow-necked Bittern of some; *Blongios noir*, French. *Kala bagla*, Hind.; *Tototan*, Java (Horsf.). *Karu Nary*, Ceylonese Tamils.

Karawal koka, *Kalu koka*, Sinhalese.

Adult male and female (Ceylon). Length 23·5 to 25·75 inches; wing 7·8 to 8·0; tail 2·7; tarsus 2·6 to 2·8, middle toe and claw 2·6 to 2·8; bill to gape 3·7 to 4·1, at front 3·25; hind toe 1·23; claw finely pectinated.

Males (Tenasserim). Length 23·0 to 24·5 inches; wing 8·12 to 8·5, expanse 30·0 to 31·2; bill from gape 4·0 to 4·25; weight 8·0 to 9·0 oz. (*Davison*).—*Female* (Furreedpore). Wing 8·0 inches; bill from gape 3·8; weight 11·87 oz. (*Cripps*).

Iris in some golden, but in most examples I have seen red of various shades, with a fine inner brilliant golden ring, a dark brownish spot being sometimes present across the red portion; bill and orbital skin livid or red-brown, darkening into blackish towards the tip of the upper mandible, the base of the lower mandible paler (especially in the female) and the tip light horny; legs and feet dark livid brown, soles yellowish.

Iris—*Female* (Furreedpore) “light purplish brown” (*Cripps*); *male* (Tenasserim) “pale brown,” *male and female* “crimson” (*Davison*). These data show the variation in the colour of the iris; the brown tint is probably indicative of immaturity.

Male (Ceylon). Top and sides of head, nape, hind neck, back, wings, and tail black, with an ashy tinge and a slightly greenish lustre on the scapulars and tertials; quills cinereous black; throat and a small spot on the face white; cheeks, ear-coverts, and a stripe down the chin and throat, spreading out over the fore neck, russet-brown, the terminal portion of the feathers black, and (on the fore neck) the outer half of one web white, imparting a striped appearance to the sides of the neck; from the white throat a broad golden-yellow stripe passes down each side, dividing the brown of the fore neck from the black of the hinder part, and becoming decomposed into stripes at the lower parts; lower neck-plumes cinereous blackish, margined with whitish and pale reddish brown; breast cinereous black, the terminal and outer parts of the lower breast- and abdominal feathers whitish; thighs concolorous with the flanks, edged with fulvous yellow; edge of carpal joint white; axillaries and under wing blackish slaty. In old birds the yellow stripe is very broad.

Female. Upper surface brown; the head and hind neck cinereous blackish; cheeks pale red-brown; the fore neck paler, the black terminal portions fading out on the lower part, which is broadly edged with white; there is more white about the throat, and the yellow stripes are broader than in the male; lower breast and abdomen whiter; thighs fulvescent whitish on the inner side.

Young. Birds of the year of both sexes have the upper parts tipped with fulvous, especially conspicuous on the back and wing-coverts, and scarcely perceptible on the crown—*males* being black, like adults, without the lustre; *females* chocolate-brown, like the adults, with the pale tippings browner; at the latter end of the first year the pale edges of the back-feathers have almost disappeared, from the result of abrasion. Birds in their first year are full-sized.

Obs. Chinese examples in the Swinhoe collection in Mr. Seebohm's possession correspond with Ceylonese. An adult

male measures—wing 8.2 inches, tail 3.2, tarsus 2.7, middle toe 2.2, bill to gape 3.9. A young bird identical in coloration with my skins measures—wing 7.9, bill to gape 3.5. Gould considers that Australian examples average smaller than Indian and Javan specimens.

Distribution.—So far as I have been able to ascertain, this species is a partial migrant to Ceylon, appearing on the west coast in November, between which month and March it may be always found in suitable localities near the sea. In the Galle district it is likewise only seen during the N.E. monsoon, and on the south-east coast I have met with it only at that period of the year. On the eastern side north of Kirinde I have never seen it; but it affects such close concealment that in wild and jungly country it is almost sure to be passed over. In July I met with it near Minery Lake, and it was no doubt breeding there; but it is apparently the exception to find it in Ceylon at that season, and unless, during the breeding-time, all the birds which are found in the Western Province effectually conceal themselves, they must, as a matter of course, leave the island. In the Colombo district it affects the secluded parts of the lake behind Colpetty, swamps near Borella, morasses and thickets bordering the Negombo canal, nooks in the Bolgodde and Panadure lakes, as well as rushy marshes and thickets near paddy-fields not far into the interior.

In India it appears to be a bird of most uncertain distribution. Mr. Fairbank records the finding of an example at Vilpati in the Palanis, and Jerdon met with it on the Malabar coast and near Madras; but elsewhere, in the south, I find no mention of its occurrence; it has not been very often met with in the Deccan, or in the tract of country between the Godaveri and the Ganges; at Calcutta it is occasionally seen in the market; but from Furruckpore it appears to be absent; while further north, in Tipperah, it has been procured. I find no record of its occurrence in the north-western part of the empire, except in Upper Sindh, and particularly on the Eastern Narra, a channel of the Indus, where Mr. Doig, C.E., found it breeding in large numbers in the month of May. Eastward of the Bay of Bengal this Bittern enjoys a wide range, extending from Burmah and Tenasserim to China, and thence southwards through the Malay archipelago to Australia. In Pegu it is found in the plains and in the nullahs of evergreen forests; but in Tenasserim it is very rare, only having been seen at Amherst, Bankasoon, and Attaran. In China it is common in summer in the central and southern portions of the country, inhabiting the mountains as well as the plains. It is found in Java, Sumatra, and Borneo, as also in Timor, Ceram, Batchian, the Aru, and other islands; it likewise occurs in the south of New Guinea, and in the northern parts of Australia round the Gulf of Carpentaria, while, on the east coast, Mr. Ramsay records it from Port Denison, Wide Bay, Richmond River, New South Wales, and Victoria. Elsewhere it is found in South Australia and on the west coast, so that it may be said to inhabit the vast length of the entire Australian sea-board. Gould first recorded it from New South Wales, Port Essington, and Swan River.

Habits.—This handsome Bittern partakes of the skulking nature peculiar to most of its relatives, and frequents, during the day, dense thickets, bushes, umbrageous creeper-covered trees, screw-pines, and such-like vegetation on the banks of water or in the middle of swamps; but more than all these does it haunt canals and dykes, which are lined with low bushy trees meeting one another and forming a dense overhanging canopy, beneath which, on moderately-sized limbs, the Black Bittern passes the day secure from scrutiny. It is also found in damp evergreen spots in timber-forests. In India it is said to affect rice-fields and reeds; but it is the exception to find it in such in Ceylon. It is not a particularly shy bird; and when it sallies out about 5 o'clock in the evening it may often be seen sitting upright, with its neck drawn in, on the top of a low bush, and on being approached will merely straighten its neck and place itself in an attitude of attention until the observer gets within easy gun-shot, when it will fly off with considerable speed, and often circle round the spot again and alight not far from its original position. It generally feeds near its roosting-place; but occasionally mounts in the air, and wends its way to distant fields, now and then uttering a loud hoarse croak. It climbs actively about the branches of trees, and always makes its way thus to the edge of the foliage before taking flight. Its food consists, to a great extent, of fish; but it likewise consumes frogs and lizards. Jerdon speaks of its low deep booming call, like the sound of a small drum; but this note I have never heard in Ceylon. During the day, when disturbed by the sound of a gun near their haunts, these birds leave their

roost, and, flying out, may sometimes be seen seated on the tops of bushes; but otherwise, after their return at daybreak from their night's work, they never stir till near sunset.

Nidification.—Mr. Doig has recently found the Black Bittern breeding on the Eastern Narra in Sindh. The nests were placed in thickets, generally "about 5 feet over the water, either in a dense tamarisk-bush or thick clump of reeds, and are about 9 inches in diameter and 3 inches in thickness, having a slight depression, in which the eggs, always four in number, are laid." These are described as being "broad ovals, sharp at both ends, and very nearly white in colour, but with faint suspicion of a delicate pale sea-green colour." They vary in length from 1·5 to 1·85 inch, and in breadth from 1·15 to 1·3.

ARDEIRALLA CINNAMOMEA.

(THE CHESTNUT BITTERN.)

Ardea cinnamomea, Gm. Syst. Nat. i. p. 643 (1788); Gray & Hardwicke, Ill. Ind. Zool. pl. 66. fig. 1 (1830-34); Hume, Nests and Eggs, iii. p. 622 (1875).

Ardetta cinnamomea (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 282 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Jerdon, B. of Ind. iii. p. 755 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1874, p. 30, et 1875, p. 404; Salvadori, Uccelli di Borneo, p. 354; Hume, Str. Feath. 1874, p. 311, et 1879, p. 114 (List B. of Ind.); David & Oustalet, Ois. de la Chine, p. 447.

Cinnamon Heron, Latham; *Le Blongios cannelle*, French. *Lal bagla*, Hind.; *Khyri bogla*, Bengal.; *Ayaman*, Java (Horsf.); *Burong kaladi*, Sumatra (Raffles). *Kuruttu Koku*, Ceylonese Tamils.

Metti korowaka, Sinhalese.

Adult male and female (Ceylon). Length 14.5 to 15.0 inches; wing 5.3 to 5.75; tail 1.6 to 1.8; tarsus 1.8 to 1.95; middle toe (without claw) 1.7 to 1.8, claw (straight) 0.38; bare tibia 0.5; bill to gape 2.45 to 2.6, at front 1.85. The tibia, in proportion to its length, is less feathered than in *A. flavicollis*; claws short, middle very finely pectinated.

Male (Furreedpore). Wing 5.75 to 6.08 inches; tarsus 2.08; bill to gape 2.8; weight 5.37 to 5.78 oz. (*Cripps*).—*Male* (Nicobars). Length 15.5 inches; wing 5.7; tarsus 1.7; bill at front 2.1 (*Hume*).—*Adult* (Formosa: coll. Swinhoe). Wing 5.7 to 6.0; tarsus 1.2 to 2.0; middle toe and claw 2.3; bill at front 1.9 to 2.1.

Iris pale golden yellow, in some with a few specks of brown; orbital skin greenish yellow; bill yellow, the culmen dark brown; legs and feet dusky greenish yellow, the tibia greener than the tarsus; soles, sides of toes, and posterior part of tarsus yellow; claws dark brown.

Head, hind neck, and all above chestnut, a tinge of ashy on the head and crest, and the wing-coverts paler than the rest; shafts of quills black; throat, fore neck, chest, and under surface yellowish rufescent, darkening to chestnut on the flanks, and with nearly always a brown stripe down the centre of the lower fore neck; a white stripe at each side of the gorge running backwards past the ear-coverts; pectoral plumes with yellowish-fulvous edgings. The "powder-down" tracts are well developed in this species.

Nestling, just fledged (Ceylon). Bill to gape 1.9 inch, tarsus 1.7. Forehead and crown olive-black; nape, hind neck, interscapulars, scapulars, lesser wing-coverts, and tertials rich dark brown, the feathers narrowly edged with rufous on the occiput, and elsewhere broadly margined with rufous buff, with a blackish inner edge; quills cinnamon-red, as in the adult; back and tail still in down (brownish, tipped with white); chin and throat whitish, with dark buff-edged centres, which widen on the chest and breast, the ground-colour there being rich buff instead of white; abdomen buffy white; thighs buff, the feathers centred with brown.

After this nestling-plumage is put off, and the dress of the first year assumed, considerable variation exists in the amount and lightness of the pale markings of the upper surface, and the dark coloration of the throat and under surface. The following is a description of a December example from the Colombo district:—

Iris yellow, with a dark spot across it; bill with the upper mandible and margin of the lower black, a dark stripe extending back to the eye; legs and feet green; toes dusky; soles yellow. Upper surface generally dark ferruginous brown, the basal portions of the feathers being reddish, while the marginal parts are brown, edged on the hind neck, back, and scapulars with buff-yellow, and deeply margined and indented on the wing-coverts with the same; quills, winglet, major coverts, rump, tail, and underlying tertials dull cinnamon, the winglet and coverts edged and indented with buff, and adjacently shaded with blackish; quill-shafts blackish and basal part of inner webs dark slate; forehead and crown ashy black; fore neck and under surface buff, boldly dashed, chiefly on one web, with rich dark sepia-brown, which down the central portion is edged with rufous, and runs up in a stripe to the chin; sides of abdomen, vent, and under tail-coverts buff, with narrow dark mesial lines; under wing-coverts fulvous yellow, with slaty centres.

In this very handsome stage the ground-colour of the upper surface is likewise subject to variation, some examples being more cinnamon-coloured than others.

At the next moult the upper surface becomes more uniform, the edgings disappear, and also the stripes on the neck and under surface, leaving in the nearly adult bird a brownish line down the centre of the fore neck, which seems in but few cases to disappear altogether.

Obs. In a series of adults from China and Formosa most examples have traces of the dark stripe down the fore neck; the hue of the back and wings is the same as in Ceylonese birds. An Amoy specimen is a good deal tinged with ashy on the head and back; but this is a point in which Ceylon birds vary. Immature birds in first plumage exhibit variations as above noticed.

Distribution.—This remarkably-plumaged Bittern is very abundant in Ceylon, being spread over all low-country marshes, paddy-fields, and swamps, and ranges into the hills to an altitude of more than 4000 feet, at which it has been procured near Banderawella by Mr. S. Bligh. Although widely distributed, it is more abundant in the west and in the damp parts of the south of the island than in the north. It is essentially a grass-frequenting bird in Ceylon, and is consequently for the most part restricted to the districts under rice-cultivation, and to moist places and swamps which afford it cover. In the north it is found mostly about rushy tanks. It is the commonest of its group about Colombo, frequenting the "water-grass" fields and swampy fern-brakes in the cinnamon-gardens. In the Kurunegala district and in the Seven Korales, as also about tanks in the Anaradhapura district, it is common.

The Chestnut Bittern appears to be distributed sparingly throughout the south of India. As regards the north-west of the empire, it has only been found in Ajmere by Major St. John and in Sindh by Messrs. Butler and Doig. Mr. Hume writes that it occurs sparingly in the Punjab, Cis-Sutledge, and in the upper portions of the North-west Provinces west of the Ganges, but only as a visitor during the wet season; he also obtained it in the Delhi, Meerut, Alleghur, Mynpooree, and Etawah districts, but has never seen it from the Central Provinces, the Punjab, Rajpootana, Guzerat, Kutch, or Kattiawar. In the district between the Ganges and the Godaveri Mr. Ball met with it but once in the State of Udipur; but about Calcutta it breeds freely, writes Mr. Hume; in Furreedpore it is common, and to Cachar it is a visitant in June. In Upper Pegu it has not been noticed, but it inhabits the lower part of the province and breeds there; and in Tenasserim it was obtained by Captain Wardlaw Ramsay on the west of the Sittang, and is common in the southern districts. Further south it has been met with at Malacca. Mr. Hume obtained it at Tellanghong, in the Nicobars, and in the island of Preparis. It extends westward to China, where it was first discovered, visiting that empire in summer, and ranging northwards to Mantchuria and Amoor Land, where Schrenk found it breeding near the village of Dawunda, on the left bank of the Amoor. It has also been found in Japan, although it is not recorded by Messrs. Blakiston and Pryer. Turning southwards we find it occurring in Formosa in summer, and recorded from the Philippines by Schlegel and Von Martens; and Mr. Everett has lately procured it in Luzon in February. In the Malay archipelago it has been met with in Sumatra, Java, and Borneo, in the latter island in the Banjermassing district. Governor Ussher records it from Labuan.

Habits.—The Chestnut Bittern prefers long grass, standing paddy, or rushes near water to swampy brushwood or even tall reeds. It is consequently invariably found in the paddy-fields in Ceylon as soon as the grain is a good height; to the fields of water-grass, cultivated near towns in the Western Province for horse-fodder, it is also very partial. It is not a shy bird, generally getting up from its retreat when you are within a few paces of it; it then flies off with a guttural but not loud *craak*, sometimes rising pretty high in the air and making the circuit of the field before alighting, at other times flying a few yards just above the grass and realighting. It drops the legs and erects the head slightly to check its progress on alighting. It feeds in the afternoon after three o'clock, for it may be seen flying about of its own accord long before evening sets in. I have rarely seen it at the edge of streams; but in India it is said to affect reed-beds and brushwood on rivers, coming out to feed in the morning and evening, and keeping quiet during the day; and, according to Mr. Davison, whose remarks I here quote, it is very shy, betaking itself on the least alarm to dense cover, from which it is very difficult to dislodge it. When wounded it fights vigorously, darting out its open bill

with great force, and making a harsh craking noise. The food of this species consists of worms, aquatic insects, frogs, and fish.

Nidification.—This Bittern breeds in the Western Province in June and July, building a nest of grass and rushes in a clump of grass in the middle of a field, or in a bush growing by the side of a drain, sometimes a few feet above the ground. A nest I found in a bush in a water-grass field near Colombo was made of dry grass, neatly hollowed out in the interior, and lined with finer grass laid crosswise in different directions, the cavity measuring about 8 inches across. Another, found by the taxidermist of the Colombo Museum at Kæsbawa, was built in the middle of a clump of water-grass, with some of the standing stalks bent down to form a bottom for the nest. This contained three fresh eggs, pure white, very oval in shape, and measuring 1.27 by 1.0 inch, 1.26 by 1.05, and 1.31 by 1.02. In India the nest has been found supported on reeds bent down for the purpose on the ground against the roots of water-plants, propped up with roots of rushes, and in all cases composed of rush, grass, reed-leaves, and stalks. Six appears to be the maximum number of the clutch, the eggs having sometimes a bluish-grey tinge, according to Mr. Hume. They vary in length from 1.2 to 1.4 inch and from 1.0 to 1.1 in breadth.

Genus NYCTICORAX.

Bill stout, high at the base; culmen curved near the tip; gonys straight, narial groove almost joining the commissure near the tip; sides of both mandibles inflated near the base. Wings rounded; 2nd and 3rd quills the longest. Tail short and rounded. Legs moderately short; tibia less feathered than in *Ardetta*. Tarsus reticulate on the inside; claws attenuated.

Head with a long crest of two or three attenuated feathers; neck short and thick.

Of nocturnal habit.

NYCTICORAX GRISEUS.

(THE COMMON NIGHT-HERON.)

Ardea nycticorax, Linn. Syst. Nat. i. p. 235 (1766, ex Briss.); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1086 (1873).

Ardea grisea, Linn. Syst. Nat. i. p. 239 (1766, ex Brisson).

Nycticorax europæus (Steph.), Shaw, Gen. Zool. xi. p. 609 (1819).

Nycticorax griseus (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 758 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1874, p. 27, et 1875, p. 403; Salvadori, Uccelli di Born. p. 356 (1874); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.); Dresser, B. of Eur. pts. 75, 76 (1879).

Nyctiardea nycticorax (Linn.), apud David & Oust. Ois. de la Chine, p. 444 (1877); Hume, Nests and Eggs, iii. p. 624 (1875).

Le Bihoreau, Buff. Pl. Enl. 758. *Wak*, Hind.; *Koma dauk*, *Oyah*, Beng.; *El Waq*, Arabic; *Kwak*, Dutch; *Gadri*, Sindh; *Guwo*, Java; *Sannary*, Ceylonese Tamils.

Ræ kana koka, Sinhalese.

Adult male and female (Ceylon). Length 21·5 to 23·5 inches; wing 11·5 to 11·7; tail 4·0 to 4·4; tarsus 3·1 to 3·3; middle toe 2·5 to 2·6, its claw 0·6; hind toe 1·1; bill to gape 3·5 to 3·7, at front 2·6 to 2·9.

Adults (Nepal). Length 20·0 to 24·0 inches; wing 10·8 to 11·5; tail 4·1 to 4·5; tarsus 2·7 to 2·9; bare tibia 0·6 to 1·03; bill to gape 3·6 to 3·9, at front 2·8 to 3·0 (*Scully*).—*Female* (Furreedpore). Wing 11·0; tarsus 2·75; bill to gape 3·82 (*Cripps*).—*Adults* (China, Formosa, ♂). Wing 11·3; tarsus 3·0; bill to gape 3·6 to 3·7.—*Adult* (Egypt). Length 21·0; wing 12·0; bill at front 2·8; tarsus 3·0 (*Shelley*).—*Male*. (Malta) Length 21·0; wing 11·7; tarsus 3·05; bill to gape 3·7. (New Brunswick) Wing 12·5; tail 4·7; tarsus 3·25; bill from gape 4·05 (*Dresser*).

Iris variable, deep red, crimson, scarlet; bill—upper mandible black, loreal skin and gape bluish green, base of under mandible greenish yellow, tip black; legs and feet pale orange-yellow, in some yellow.

Head, nape (on which the feathers are much elongated), upper back, and all but the lower or underlying scapulars metallic black-green, pervaded with ashy in some lights; forehead round the eye, chin, cheeks, throat, and all beneath white, washed with buff on the underparts, most conspicuously on the lower neck-plumes, and darkening on the sides and back of neck into delicate ashy greyish; wings, lower back, and tail sombre bluish grey, darkest on the tertials and centre tail-feathers; edge of wing, margin of first primary, and a long crest of two or three narrow feathers, closely overlying each other, white; the crest-feathers 6 to 7½ inches in length. The underlying or broad scapular feathers in some are partly coloured as the uppermost, and in others wholly grey. The back of the neck is almost white in some, and the under surface likewise lacks the buff tint.

Young. The nestling has the eye pale sea-green; lores and bill tinged with yellowish green; legs bluish sea-green above, sienna-yellow beneath; colour of the down light purplish grey, tipped with white on the crown, and giving place to white on the flanks and belly; bare skin of the belly and also of the back sea-green. (*Swinhoe*.)

In the *first plumage* the iris is orange, orbital and loreal region greenish, the tips of both mandibles yellowish horny; legs and feet bright pea-green, soles yellow: wing 10·3 to 10·5.

Upper surface light cinereous brown, darkening to glossy blackish brown on the head, and to a slightly less intense hue on the interscapular region, while the wings are brownish slaty; feathers of the head and upper back with whitish narrow mesial lines, the hind neck edged buff, and with fulvous white mesial centres; the scapulars and median wing-coverts with broad angular white terminal spots, and narrow mesial lines on the latter, the greater wing-coverts, winglet, and secondaries with deep white tips, and the primaries with whitish-grey tips; the least coverts are narrowly edged with buff; the face and cheeks are striated with dark brown on a white ground; chin and throat, centre of fore neck, breast, and lower parts buff-white, the feathers on the middle of the fore neck

with dark brown dashes, those on the breast with cinereous edges, and the rest unmarked; thighs light slaty, edged fulvous; the inner sides whitish.

At the next stage, which is probably at the commencement of the second year, the legs are greyish yellow. Upper surface of a much darker cinereous brown, the head and upper back washed with blackish green, the head and hind neck with fulvous mesial stripes; the edges of the wing-coverts are fulvous and indistinct, as also the angular tips of these feathers; tips of the winglet and secondaries with one or two of the outer primaries white; face and sides of neck darker, with buff stripes; the fore neck and breast buff-white, shading into slaty grey at the exterior of the feathers; the thighs whitish.

The crest is not assumed until the uniform plumage of the adult is acquired, which is probably not until the third year. It usually consists of two or three feathers; but occasionally specimens have five or six; and Mr. Dresser instances one with *ten*.

Obs. Chinese specimens are identical with Ceylonese; the tints vary in the same manner, some are more buff beneath than others; and this is probably a result of age. As will be observed from Mr. Dresser's measurements, American specimens are the largest. Layard's dimensions for South-African examples are likewise large, if correct—wing 13.0.

N. caledonicus, Lath., is the Malayo-Australian representative of this species, and differs in having the mantle, scapulars, wings, and tail fine cinnamon-colour; the crest-feathers are similar and the legs longer: wing 9.5 to 10.5 inches. It is beautifully figured in Mr. Gould's 'Birds of Australia.'

N. manillensis, Vigors, which inhabits the Philippines, is larger than the last-named, and with the red of the upper surface deeper: wing 11.0 to 11.5 inches.

Distribution.—The Night-Heron is found in most low-country districts of the island; but it confines itself to particular localities, and is easily passed over if the secluded spots in which it takes up its quarters do not happen to be visited. It is now and then seen on the Colombo lake, but only as a straggler. At the head of the Bolgodde lake, in a small arm overgrown with immense reeds, and lined with thickly-foliaged trees, I found a very large colony. On the Amblangoda lake there is another. About Matara it is not uncommon, and near Tangalla Layard discovered it on a lake there. Numbers were found by me at the tank before mentioned, near Tissa Maha Rama. It occurs near large tanks in the Eastern Province, and in the Trincomalee district I have discovered small colonies. At the head of the Pootoor lagoon, in the Jaffna peninsula, it also occurs; and Mr. Parker informs me that it is not uncommon in suitable localities throughout the North-western Province.

In India it is very common in many parts, but, as in Ceylon, it is local in its distribution. It is moderately common in the Deccan, and likewise near Ahmednagar; also in Chota Nagpur, where Mr. Ball records it from the Rajmehal hills, Manbhum, Lohardugga, Singhbhum, Sambalpur, Orissa, Nowagarh, and Karial; and Mr. Hume notes it from Raipur. It occurs about Calcutta, and in Furruckpore is abundant. It is not recorded from Cachar. In Upper Pegu it is abundant in the great Engmah swamps, and breeds in great numbers near Myitko, on the Sittang. Dr. Armstrong found it rare in the delta of the Irrawaddy; but in Tenasserim it is generally distributed. Mr. Davison noticed it in the Nicobars; but I do not find it recorded from the Andamans. Returning to the mainland, it is common in the North-west Provinces, and is found further north in the Punjab and Cashmere, extending into the Himalayas up to an altitude of 6000 or 7000 feet. It is distributed throughout Sindh, Kutch, Kattiawar, and Jodhpore; but is not recorded from the vicinity of the Sambhur lake by Mr. Adam. It has been met with in Persia at Isfahan and in the Shiraz district, and inhabits the western portions of Turkestan, breeding up to an altitude of 4000 feet. Dr. Scully did not observe it in Kashgharia, nor did Przevalsky encounter it anywhere in Mongolia, although it is very common in China, particularly about Peking. It is generally distributed in South Japan. Southward it is resident in Formosa as well as in China, and likewise inhabits the Philippines. It is recorded from Celebes, Ceram, Bornco (Banjermassing), Banka, and Java; but further south is replaced by *N. caledonicus*, which is also found in Celebes.

Returning now to the continent of Asia, it does not appear to range further north than Turkestan. Canon Tristram met with it in Palestine, and it also occurs in Asia Minor. In Europe it is chiefly a summer visitant, inhabiting as such the southern countries and the Mediterranean islands, and passing into Northern Germany, Poland, and Holland, where it used to be commoner than it is now. It, however, breeds in the

south of France, though it occurs only on passage in the north. To the British Islands it is a rare straggler, having occurred chiefly in the southern and eastern counties as far north as Northumberland and Durham, while in Scotland it has been met with as far north as Aberdeen. It has been shot in Anglesea and Flintshire, and has been met with occasionally in Ireland, once in the county of Donegal. It has also occurred in the Faroes and in Sweden, but not in Norway; in Denmark it is very rare. In Central Russia it is also scarce, but common in the south and even on the Lower Volga. Turning now towards Spain and thence to Africa, we find it common in the southern portion of the first-named, breeding in the marshes of the Cotos, and passing north through Andalucia in April. It appears to pass by Portugal in its migration, as it is not common in that country. In Morocco it is chiefly seen on passage, being common there near Tangier. Canon Tristram met with it in Algeria and Tunis, and in Egypt it is abundant. In January, February, and March, Von Heuglin met with it on the Blue and White Nile, and at the Tana Lake in Abyssinia, where he also saw it on the river Reb in May. It extends to South Africa, having been obtained in the Zambesi country, in the Transvaal, and in Natal, and is generally found throughout Cape Colony. In Damara Land it is rare, according to Mr. Andersson; but in the lake-country it is pretty common, occurring in Ondonga in the wet season, and also on the Orange river. Further north it has been obtained in Benguela and Gaboon, on the Gold Coast, in Fantee, Senegambia, and Bissao. Vernon Harcourt records it from Madaira; but it does not appear to have been met with there of late years.

On the continent of America it has a wide easterly range, extending from New Brunswick through the States to Texas and Central America, in the former of which Mr. Dresser found it common. In South America it ranges, according to Von Frantzius, from Guiana to the Argentine Provinces, being rare in Costa Rica. It is likewise found in some of the islands in the West Indies, being resident in Cuba.

Habits.—This curious bird is almost entirely nocturnal in its habits; but I believe it feeds chiefly at dusk and in the early morning. It is seldom seen about in the daytime; but occasionally it happens, for some reason or other, that it makes diurnal excursions. Mr. Ball writes, "On a very hot day in April, when in the district of Singbhum, I saw a large number of them in the bed of a river standing by the water's edge, and perched about on neighbouring bushes." My own experience in Ceylon is that when aroused by the report of a gun, a whole flock will dash out of the umbrageous trees in which they have been hiding, and circle round and round in the air, some turning right away and taking a long flight across country. It frequents secluded portions of lakes and tanks, where there are reed-beds surrounded by bushy trees, in which it roosts by day, as many as thirty or forty sometimes occupying the same tree. In the forest-districts it resorts to village tanks surrounded by thick jungle growing close to the water's edge; and when a colony has taken up its abode in any place, its members dwell permanently there, breeding close at hand, or perhaps on the very spot. At sunset they sally out, flying with slow noiseless owl-like flaps, and frequently uttering their quick hoarse *quūk* at intervals of some little duration; and this call is often heard as night closes in, when the bird cannot be seen. When perched, the Night-Heron draws the neck in, the bill projecting from close to the shoulders, and the body upright, imparting an ungainly appearance to the bird; if disturbed, it makes its way quickly through the tree, adroitly climbing from branch to branch, and flying off quietly on the other side. Mr. Dresser has noticed it climbing about reeds and rush-beds in Texas, "grasping the stems of the water-plants with its long claws." It has the power of balancing itself in a wonderful manner when walking along a small branch; and Mr. Gurney speaks (*Ibis*, 1868, p. 257) of one, which was confined in the Zoological Gardens, "walking leisurely along the slender upper bar of an iron railing, some three yards in length, preserving his balance most perfectly, keeping his body nearly parallel to the horizontal iron bar, and not in any way resorting to the aid of his wings." A fine living example was brought to me at Galle in 1873, and I placed it in a large bamboo aviary, in which were confined a Crested Eagle and a Wood-Owl, both referred to in the early part of this work. On being first placed in the aviary, it slunk into the corner, and did not become aware of the presence of the Raptorial birds; about an hour afterwards it discovered them, and displayed the most curious movements of surprise and curiosity. Its head moved at slight intervals from side to side, but with an instantaneous jerk, and shot out every now and then with the same movement, the feathers of the back, neck, and occiput being at the same time erected and the eyes fixed on the two birds, one of which (the Owl) manifested the most intense surprise at the extraordinary creature beneath him, while the Eagle stood on one leg, with

the other composedly drawn up, and twisted his head upside down, to get a better view of the stranger! It was, on the whole, one of the most comical bird-sights I ever beheld. Subsequently, when either of the birds approached it, it shot out its head in like manner, erected its feathers like a porcupine, and gave vent to a loud Heron-like erake, quite different to its usual hoarse croak. It eat nothing for weeks, although I tried it with worms, frogs, &c.; and as it appeared to be thriving, I was under the impression that it captured worms at night from the floor of the aviary. One morning, however, I found it dead; and on skinning it, it was almost a skeleton, proving that it had eaten almost nothing for seven weeks! Its legs had changed from orange to pale yellow.

The food of this Heron consists of fish, worms, frogs, and large aquatic insects. In India it nearly always roosts on tamarind-trees.

Nidification.—The Night-Heron breeds in the early part of the year in Ceylon. In March 1872 a colony were nesting at Uduwila tank, near Tissa Maha Rama; they chose the thickly-foliaged trees, apart from those on which the Herons, Ibises, Cormorants, and Pelicans were nesting; and the nests, made of small twigs and sticks, were concealed among the branches. There appear, however, to have been other birds (*Herodias garzetta*) nesting in the same tree, as some eggs I took, and sent to Mr. Hume, turned out to be too small for the Night-Heron. In India, where it breeds often in its favourite tamarind-tree, but also occasionally in rushes and reeds, the breeding-time is in July and August, and in Cashmere in April and May. The eggs are short ovals, and delicate pale sea-green in colour, ranging in length from 1.68 to 2.06, and in breadth from 1.3 to 1.45 inch (*Hume*).

In China, where it is held sacred in some parts, it nests in public places. Mr. Swinhoe gives an account of a colony at the great Honan Temple, where the nests are placed in banyan-trees within a foot of each other. The parents supplied their young with food throughout the day; but at night they all became more active, flying off their nests, and settling first on the bare arms of the cotton-trees (*Bombax malabaricum*), like gaunt spectres, after which they flew away one after the other, "seldom more than two in the same direction." As darkness set in, he writes, "many returned, and the noise and hubbub from the trees rose to a fearful pitch."

Genus GORSACHIUS.

Bill short, stout, curved; the gonys short and slightly ascending; nasal groove deep. Nostrils wide; under mandible laterally compressed at the base. Wings pointed, the 3rd quill the longest; tertials lengthened, exceeding the closed primaries. Tail short. Legs and toes short; tarsus reticulate. Toes bordered by a narrow membrane; hind toe proportionately long; claws short.

Neck short and densely feathered; head crested; plumage soft.

Of nocturnal habit.

GORSACHIUS MELANOLOPHUS.

(THE MALAY BITTERN.)

Ardea melanolopha, Raffles, Tr. Linn. Soc. xiii. p. 326 (1821, Sumatra).

Tigrisoma melanolopha (Raffl.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114.

Ardea goisagi, Temm. et Schl. Faun. Japon. *Aves*, p. 116, pl. 70 (1850), ex Temm. Pl. Col. 582.

Gorsachius melanolophus (Raffl.), Houldsw. P. Z. S. 1872, p. 478; Salvadori, Uccelli di Born. p. 355 (1874); Walden, Tr. Zool. Soc. 1875, ix. p. 238; David & Oustalet, Ois. de la Chine, p. 444 (1877).

Goisakius melanolophus (Raffl.), Hume, Str. Feath. 1874, p. 312, et 1879, p. 71 et p. 114 (List B. of Ind.); Bourdillon, ibid. 1875, p. 524.

The Malay Tiger-Bittern of some.

Ræ koka, Sinhalese.

Adult male (Ceylon). Length 19.5 to 19.7 inches; wing 10.5 to 10.7; tail 3.75 to 4.0; tarsus 2.6 to 2.8; bare tibia 0.75; middle toe 2.0, claw (straight) 0.3; bill to gape 2.5 to 2.7, at front 1.8; pectination of middle claw even, expanding and reaching to the tip of the claw.—*Male* (Travancore). Length 19.62; wing 10.37; tail 3.62; tarsus 2.69; middle toe (with claw) 2.0; hind toe 1.06 (*Bourdillon*).—*Female* (Nicobars). Length 17.0; wing 9.12; tail 3.0; tarsus 2.3; bill from gape 2.4; weight 0.75 lb. (? 1.75) (*Hume*).

Iris golden yellow, "frosted" or stippled with olive at the exterior; gape, orbital and loreal skin greenish and slaty; culmen black; sides of upper mandible and the lower fleshy; legs and feet greenish, washed with brown on the front of the tarsus and toes.

Top of head, nape, and long occipital crest blackish slate, pervaded with an ashy hue; face, over the eye, hind neck and its sides cinnamon-rufous, pervaded near the edges with ashy, and more particularly on the cheeks; interscapular region, scapulars, wing-coverts, and tertials duller rufous than the hind neck; the feathers mottled with obscure slaty, this being almost absent on the interscapular part, which is pervaded with bluish ashy; lower back and tail ashy brown; primaries, winglet, and secondaries blackish slate; terminal portion of primaries and secondaries dull rufous; primary-coverts brighter rufous, tips of three first primaries and two outer winglet-feathers white; chin and gorge white, blending into the ashy fulvous of the fore neck; the plumes of the throat and middle of the lower neck for the most part white on one web and more or less black on the other, marked with rufous and buff, on the first-named part these are mostly concealed; feathers of the chest mostly white down the centre, surrounded by rufous or fulvous which is clouded with black; on the breast the white spreads over one web, leaving the other rufous, crossed and marked with white; towards the abdomen the white predominates, the rufous gradually disappearing, the edges paling to buff and marked with blackish brown; flanks crossed with black and white dashes, the edges of the feathers being fulvous, mottled with black; major, secondary, and tertial under wing-coverts handsomely crossed black and white, and washed on one web with rufous; lesser coverts blackish brown, barred and spotted with white, those beneath the ulna and the metacarpus being washed with rufescent. The "powder-down tracts" are small and grey in this bird.

Female (Nicobars). "Iris greenish yellow; upper mandible horny brown, edged with dull green; lower mandible greenish horny; legs and feet dull green, claws horny. Differs from the male in having no line of dark spots down the centre of the chin and throat, in having no feathers of the crest as dark as in the male, and in having several of them, and amongst others the longest, a sort of purplish red instead of black; the whole mantle is somewhat paler, and the quills are markedly slaty; the barriings of the wing-lining, sides, &c. are much less conspicuous and less tinged with ferruginous; the ground-colour of the breast is more of a fawn-colour tinged with ferruginous, and there is much more white about the abdomen, and this is less rufescent than in the male." (*Hume*, comparison of Nicobar female with a male.)

Concerning a specimen in the Colombo Museum, I find I have noted that the chin and throat are pure white, con-

trasting with the blackish-brown sides of the fore neck, which are barred with fulvous, but no mention is made of the different colour of the crest. It is important to note that in Mr. Hume's specimen some of the feathers are ferruginous, as this is the main point in which most of the Japanese examples have differed from Indian; and it may be that the rufous colour is a sexual peculiarity; but it is more likely an individual one, as will be seen presently.

Young nestling (Takow: Mus. Seebohm). Primaries half-grown; wing 7.0 inches, tarsus 2.7.

Head and occipital feathers black; the coronal feathers with pure white mesial lines, and the occipital feathers with oval central spots, two on some feathers and one on others; hind-neck feathers brown, with transverse spots of white; back and scapulars brown, with narrow wavy cross bars of buff, almost obsolete on the back, taking the form of wavy pencillings on the wing-coverts, and there overcoming the dark markings; the winglet, primary-coverts, and quills nearly as in the adult, but the latter wanting the rufous near the tips; tail brown; chin and throat whitish; fore neck dusky buff, barred with blackish; on the sides of the neck the barring is narrow; breast buff, barred and irregularly marked with slaty blackish; lesser under wing-coverts the same, the greater series white with dark bases.

A second nestling of same date (June 1865), and probably a fellow bird, is marked on the head in the same manner, but the back is altogether different, the major portion of the feathers being black with a large buff central spot and indistinct tipplings of rufescent; the ground-colour of the wing-coverts is more rufous; surmounting the white tips of the primaries there is a small amount of rufous.

Immature birds almost, if not quite, equal adults in size. An example in the Colombo Museum measures—wing 10.1 inches; tail 3.75; tarsus 2.5; bill at front 1.2. During adolescence the plumage is somewhat similar to that of the nestling's above described, being characterized by the white tips and bars on the crest-feathers and the conspicuously marked upper surface.

An *immature* example shot near Colombo has the forehead, crown, and long crest-feathers black, with buff tips on the head, and white central spots and tips on the crest-feathers; back and sides of neck and whole upper surface dark bluish brown, with irregular wavy bars and edgings of buff and light ferruginous; upper tail-coverts and rump blackish brown, with a white spot near the tip of most of the feathers; quills and tail much as in the adult, but with more of the tips white and less chestnut adjacent to them; tertials conspicuously mottled like the scapulars; primary wing-coverts chestnut with white tips, edged above with dark pencillings; chin and throat white, the centre of the fore neck conspicuously marked with brown, white, and ferruginous; the lower neck-feathers mottled with ferruginous on the inner webs, and with a longitudinal black border down the shaft, and the outer webs white, with yellow edgings; under surface as above described in the adult.

Obs. A male from Formosa has the head rufous like the hind neck, just tinged with ashy, the crest rufous and not so long as in other specimens; the interscapular region and back are uniform dark rusty brown; the ground-colour of the wing-coverts is rufous; there is a stripe down the throat, and the dark markings of the breast and flanks are very bold. Dimensions—wing 10.2 inches, tarsus 3.05. This specimen has some resemblance to a figure of a "young female" in the 'Fauna Japonica,' pl. 20. Two other examples in the "Swinhoe collection," from Formosa (not sexed), have the head equally dark; but one is more rufous throughout than the other. The ground-colour of the wings of the paler bird is rufescent buff; the underparts are in a corresponding degree white, lacking the rufous edgings on the abdominal feathers. It corresponds with the description above given of the Nicobar female, but it has a stripe down the chin. Dimensions of these two birds—wings 10.3 to 10.5 inches; tarsus 2.6; bill to gape 2.4 to 2.7. On the evidence afforded by the first of these three specimens, procured in March, Swinhoe affirms that the dark crest in the Eastern form is dropped in winter and red feathers worn instead. I think, however, that this solitary evidence is insufficient, particularly as we have a Nicobar female in much the same plumage. It would appear rather to be an individual peculiarity; and I see no reason to consider the Japanese and Formosan bird distinct from the Malaccan. Lord Tweeddale, however, affirms that the bill, in all Malaccan examples he has examined, is longer and straighter than in a Nagasaki specimen.

Distribution.—This handsome Bittern, which is a north-east monsoon migrant from Malacca to India and Ceylon, was discovered in the latter many years before it was noticed on the mainland. Layard procured three specimens about Colombo in November 1852, and added the species to the avifauna of Ceylon in his "Notes." Many years after, in the same month in 1860, Mr. Holdsworth captured a specimen at Aripu; and again, in November 1876, a fine example, now in the Colombo Museum, was shot near Colombo. Another specimen was caught on the Colombo lake in November 1875; and in October of the following year a male

(above described) was captured at Mutwal and brought to me, whilst a female at the same time was procured in the vicinity of Colombo and taken to the Colombo Museum. A few months afterwards, in March 1877, an example was killed in jungle in Maskeliya at an elevation of 6000 feet. It will be evident to my readers, from the above data, that it arrives on the west coast of Ceylon in October and November, and is then captured in populous districts like Colombo before it makes its way inland. It is worthy of note that it has not been met with on the east coast, notwithstanding that it migrates from the east to Ceylon. It may have a tendency to move westward as far as possible, and may, consequently, cross the north of Ceylon and follow the west coast down, or it may first arrive in the south of India and wander south with the long-shore wind.

It was first procured in South India in January 1878, when a specimen was captured in the hills of Southern Travancore at about 2500 feet above the sea-level, and passed into the hands of Mr. Bourdillon; and about eighteen months previous to that time Mr. Hume writes that Mr. Inglis procured an example at Dilkoosha, North-eastern Cachar. It was met with in the Nieobars by Mr. Davison at Camorta, where two birds were captured at False harbour; and at Tellanehong Mr. Hume procured a third; while he subsequently writes that other specimens have been obtained in these islands. It has been seen in Tenasserim in the mountains north of Malewoun. In the peninsula of Malacca it is supposed to be resident, and is probably so in Sumatra, whence it was first described by Raffles. It has recently been obtained at Brunei and on the Lawas river in Borneo by Mr. Treacher. Northward in the Philippines it has been also procured, as there is a specimen in the British Museum from that locality. It is resident in the island of Formosa, in which Swinhoe procured five specimens—one, a male, in March, two young in July, and two adults in May; the young birds were captured at the foot of the mountains; Swinhoe remarking that the species is chiefly confined to the jungly interior, rarely occurring on the plains. Père David notes it from Cochin China. From Japan Temminck first recorded it, and subsequently specimens have been obtained at various localities, one of which is noted by Mr. Blakiston from Yokoska, Tokio Bay.

Habits.—From observations made in the Nicobars and Formosa, as also on one occasion in South India and in Ceylon, it is pretty certain that this Bittern is chiefly an inhabitant of jungle, frequenting the borders of streams lined with rushes, small swamps, and scrubby morasses in forest. In Ceylon it has been for the most part captured in comparatively open situations; but this has been owing to its having been met with directly after its arrival, on the shores, and before making its way into the interior. Mr. Holdsworth obtained his example in some bushes close to his house by the seashore. Most of the specimens procured near Colombo came from the Slave-Island Lake; and the bird brought to me was captured in the top of a cocoanut-tree from which "toddy" was being drawn, and having endeavoured to allay its thirst in the toddy-chatty, had become stupid and was easily captured! Such was the account, at least, given by the native; and certainly the bird presented all appearance of being in a state of intoxication. It stood with closed eyes, allowing its head to droop forward every now and then until its bill touched the ground, and when pushed would wake up with a start and a flap of its wings. In this state it remained for about two hours after it was brought to me, and then recovered itself. It was placed in an aviary in company with a Wood-Owl (before mentioned) and a Skua (*Stercorarius antarcticus*), and when accustomed to its new abode passed much of its time perched on a low stake, its usual attitude being with the neck drawn in, the head kept forward, and the bill pointed upward, its eyes all the time possessing a vacant stare. It would patrol round and round the aviary with slow and stealthy steps, and always snapped up whatever fell from the Owl's perch. Large pieces of meat were swallowed greedily, and insects picked up from the ground. When inclined to be pugnacious, he would elevate his crest and puff out the feathers of his face and throat, spasmodically opening and shutting his bill at the same time. After a while the Skua tormented him sadly, seizing him always by the wing and dragging him about the aviary; he seemed to be much afraid of this bird, not offering to defend himself, although he always remained hostile to the Owl. Mr. Davison was informed by natives in Camorta that the note of this Bittern was loud and like a bark, and they asserted that it remained throughout the day seated on a branch or concealed among *Pandanus*-thickets.

Nothing is known of the *nidification* of this species.

Order STEGANOPODES.

Bill varied, straight, and pointed in some, hooked in others, furnished with a pouch beneath, more or less developed. Wings pointed, mostly long. Tail very varied. Legs and feet short. Toes fully webbed, the hind toe directed inwards, except in one family; the outer toe longer than the middle.

Of oceanic habit, taking their prey either by pouncing or swimming. Young born blind and helpless. Sternum wide; the keel not produced much beyond the middle, its upper edge in the prolongation of the posterior part of the sternum; the furcula united to the keel by a close joint, in some completely joined to it.

Fam. PHAETHONTIDÆ.

Bill stout, not hooked at the tip, the margins serrated. Tail with the centre feathers long and much attenuated. Legs short. Feet large; the toes webbed, the hind toe directed inwards and webbed.

Of comparatively small size. Plumage satiny and white.

Genus PHAETHON.

Bill stout, acute at the tip as in *Sterna*, but curved throughout, with the gape wider and angulated or lobed; the margins serrated. Nostrils basal, linear, placed in a membrane near the culmen. Wings moderate, pointed, the 2nd quill the longest, 1st exceeding the 3rd. Tail short, pointed, the central pair of feathers enormously elongated and attenuated. Legs short, tarsus reticulate. Feet finely webbed; hind toe short, directed to the front and webbed.

PHAETHON FLAVIROSTRIS.

(THE YELLOW-BILLED TROPIC-BIRD.)

Phaëton flavirostris, Brandt, Bull. Acad. Sc. St. Petersburg, ii. p. 349 (1837); Holdsw. P. Z. S. 1872, p. 482; Hume, Str. Feath. 1874, p. 323, et 1879, p. 116 (List B. of Ind.); Penrose, Ibis, 1879, p. 277.

Phaëton candidus (Briss.), Jerdon, B. of Ind. iii. p. 850.

Phaëthon flavirostris, Brandt, Sclater & Salvin, P. Z. S. 1878, p. 651.

Boatswain-bird, *Bo'sun*, of sailors. *Paille-en-queue*, Seychelles; *Tavaki*, Polynesian islands.

Adult male (Andamaus). "Length 30.0 inches; wing 10.75; tail 18.75; tarsus 0.9; middle toe and claw 1.6; bill at front 2.1." (Hume.)

Adults (West Indies: Mus. Salvin and Godman). Wing 10.5 to 11.2 inches; tail 18.0 to 20.0; tarsus 0.85; middle toe (without claw) 1.45; bill to gape 2.2.

Iris brown; bill pale gamboge-yellow; legs and feet fleshy, tarsus and base of toes yellowish; tips of toes blackish. Plumage glossy white, with the following parts black:—a band across the lores continued over the eye and beyond the ear-coverts, a stripe along the median wing-coverts from near the point of the wing to the tertials, the uppermost series of the latter feathers and the terminal portion of the scapulars, a broad stripe down the 1st four primaries from the base to the tip; also the shafts of the primaries and their coverts, of the secondaries and all the tail-feathers, in each case not quite to the tip.

Young. At first naked and then covered with long woolly down, dingy white, sullied with grey on the head, back, and pinions. An example before me, kindly lent by Canon Tristram, has the bill yellow, with black tips; legs yellowish, feet dusky; bill to gape 1.52 inch, tarsus 0.6.

In *immature plumage* it is to be presumed this species is barred on the hind neck, back, and wings like the other members of the genus; but I have been unable to detect any such specimens in collections, and Canon Tristram and Mr. Salvin both inform me that they have never met with the bird in this stage.

Obs. The Red-tailed Tropic-bird may possibly occur on the coasts of Ceylon. Mr. Holdsworth includes it in his list; but I incline to the opinion that the birds he saw belong to the species noticed below. *P. rubricauda* has the bill

? PHAETHON INDICUS.

(THE LESSER TROPIC-BIRD.)

Phaëton æthereus (Linn.), Hume, Str. Feath. 1873, p. 286; Heuglin, Orn. N.Ost-Afr. ii. p. 1467 (1873).

Phaëton rubricauda (Bodd.), Holdsw. P. Z. S. 1872, p. 482.

Phaëton indicus, Hume, Str. Feath. 1876, p. 481, et 1879 (List B. of Ind.), p. 116; Butler, ibid. 1877, p. 302.

Males (Gulf of Oman). Length (excluding elongated central tail-feathers) 19.85 to 23.4 inches; wing 10.75 to 11.8; tail 7.5 to 10.3; expanse 37.0 to 39.5; tarsus 1.0 to 1.13; middle toe and claw 1.55 to 1.8; bill at front 2.2 to 2.45; weight 1 lb. 1 oz. to 1 lb. 4 oz.—*Female*. Length 24.0; wing 11.7; bill at front 2.4; tarsus 1.0. (*Hume*.) Iris deep brown; bill dull orange-red, margins of both mandibles, nostrils, and tip dusky; legs and hallux and its web and basal joint of other toes white, tinged bluish and creamy yellow. (*Hume*.)

Plumage white, barred on the back, scapulars, rump, and upper tail-coverts with black; a black crescent in front of the eye, and a narrow black line from the gape along the bill to the culmen; a black line from the posterior angle of the eye running round the back of the nape, the feathers above this collar on the nape with a black bar at the tip; the winglet, the greater coverts of the first five primaries, the shafts and outer webs of these latter feathers, together with a narrow stripe along the shaft on the inner web, black; tertials and their greater coverts black, narrowly margined on the exterior webs and tipped with white; shafts of the inner primaries black at the base, likewise those of the tail-feathers.

Obs. Mr. Hume separates the Tropic-bird inhabiting the Indian Ocean from the larger and widely-distributed species *Ph. æthereus*, Linn., on account of its shorter tail and constant barred plumage, the old birds of the latter, according to Messrs. Finsch and Hartlaub, losing this barring. He unites the birds procured in the Gulf of Oman (of which the above is in essence his description) and those obtained at the Laccadives with the Red-Sea bird, of which the tail-measurement, as given by Heuglin, is 9.87 to 12.61. These measurements slightly exceed the above-quoted, but are not, of course, to be compared with those of the Atlantic and Pacific form, the tails in which I find, on examination of a series in Messrs. Salvin and Godman's collection, vary from 10.0 to 23.0 inches. The constantly shorter tail (and the wing, from 10.5 to 11.2 inches) is perhaps sufficient ground for the separation of the Indian form; but I think the question of the barred plumage is doubtful. I find no *white* birds in Messrs. Salvin and Godman's collection, and the former gentleman tells me he has never seen one. Is it not therefore possible that the Pacific bird spoken of by Messrs. Finsch and Hartlaub may belong to an indiscriminated local form?

I doubtfully identify the Tropic-birds seen by Mr. Holdsworth with this species, as he affirms that they had *white* tails.

Distribution.—This Tropic-bird has been observed by Mr. Holdsworth during his annual cruises off the west coast of

coral-red and the legs yellow. The adult is white, with a black band in front of the eye; the shafts of the primaries and secondaries black, except near the tips; the tertials with a black band down the centre, terminating $\frac{3}{4}$ inch from the tip; shafts of the tail-feathers black, the attenuated portion of the centre pair with the webs red, the centre of the feather black towards the base in continuation of the red; axillaries with a slaty-black central stripe. Wing 13.5; tail 14.4 to 20.0 inches (British Museum). This species is common in the southern parts of the Indian Ocean, breeding at Round Island near Mauritius; it also extends to the tropical parts of the Atlantic, breeding at Ascension Island. It is a straggler to the Bay of Bengal.

Distribution.—Mr. Holdsworth mentions in his catalogue (*loc. cit.*) having seen this bird, to the best of his belief, off the shores of Ceylon. Mr. Bligh, however, had the good fortune to pick up a dead bird on the Galle face in 1870, and preserved the skin. It is an inhabitant of the southern parts of the Indian Ocean, breeding probably at Round Island and Rodriguez, as also in Madagascar; and is not uncommon about the Seychelles, having been met with there by Mr. E. Newton, breeding in the island of Mahé. It strays northward into the Bay of Bengal, and has been got at the Andamans, where Col. Tytler shot a male specimen, which he perceived for some days hovering about a dove-cot in Ross Island, apparently attracted by the white pigeons in it. Further north still, and in a strange locality, a specimen was met with by Mr. Inglis at Dilkoosha, in the north-east of Cachar, about 170 miles from the sea! It was frequenting a river (having probably been driven inland by a storm), and was captured by some native boys! I find no further record of its occurrence within Indian limits than these few instances of stragglers thither; and further west, in the Red Sea, I observe that Heuglin did not meet with it, which shows that its habitat is for the most part south of the Line as regards the Indian Ocean. The above is the only instance of its occurrence in Ceylon.

In the Atlantic it frequents the vicinity of the islands of St. Helena, Ascension, and Bermuda, and is

Ceylon, and is no doubt a not infrequent visitor to the shores of the island. Mr. Hume procured a specimen about thirty miles from the Cherbaniani reef in the Laccadives, and has met with it along the west coast of India northward to the Gulf of Oman generally, "in a zone between about seven and thirty miles off the shore." In the latter locality he styles it as "not uncommon." Captain Butler met with it in these waters off the Mekran coast between Ormarra and Gwadar. In the Bay of Bengal a species answering to the same description has been seen of late, about lat. 9°, by Mr. Davison; but whether it extends eastward of Singapore I am unable to say. Its head-quarters appear to be the south coast of Arabia, the Gulf of Socotra, and the southern portion of the Red Sea; here Heuglin found it abundant and nesting in the Dahlak archipelago. Southwards it probably extends along the east coast of Africa, perhaps ranging to the Seychelles and Madagascar.

Habits.—This species partakes of the same fearless and inquisitive nature as its fellows. Mr. Hume writes of it:—"They flew about the ship much like Terns, with their longish bills pointed downwards, after the manner of *Sterna caspia*, and seemed totally fearless; in fact were attracted to the vessel by guns which we fired at other birds. They did not, any of them, come very close, not more than seventy or eighty yards as a rule; but they flew round and round at this distance for some time; they were in several parties of from five to twenty." Von Heuglin remarks that they are to be met with either singly or in pairs, but that occasionally they associate in small, though not very sociable, colonies, as the males are of a pugnacious nature. He styles their note shrill, and says that on stormy days they affect the vicinity of cliffs, where they are within reach of shelter, but in clear weather they frequent the open sea. In pairing-time these birds show to advantage, when the males engage in sundry aerial combats, and dash about, pursuing one another with screams.

Nidification.—Von Heuglin found this species breeding in the Red Sea, at the Dahlak archipelago, in June and July. On the island of Sarat el Kebir especially he found many nests in clefts in the rocks, in caves and under boulders; the entrances to the holes were so narrow that it did not seem possible for the bird to pass into the interior. The female lays a single egg on the bare ground or rock at the end of the holes, which were 3 or 4 feet deep, and the nest-cavity was generally behind a corner of rock at the end of the passage, so that the bird could not be seen from without: both sexes appeared to assist in the work of incubation; and in the heat of the day Von Heuglin generally found one of the birds in the hole, in which they lie very close. The egg is described as proportionately large, glossless, and rather more round than elongated; they vary from 25 lines (2.09 inches) to 26 lines (2.15) in length, and from $16\frac{1}{2}$ lines (1.34) to $18\frac{1}{2}$ lines (1.55) in breadth. The ground is a clear grey clay-colour, or a reddish or violet-grey, and the markings consist of dark violet specks and points, over which are larger spots of rusty brown and earth-brown, with occasionally a few blackish streaks; now and then the markings take a zone-like form.

likewise found in the West Indies. In the Pacific it is widely distributed among the islands of Polynesia. Layard records it from Fiji, and it is included in M. Marie's list of New-Caledonian birds. It has recently been procured by a German naturalist, Mr. Hübner, in the island of Eua, whence also Layard obtained its egg. It has also been procured of late in the islands of Ponape and Niwafou; Canon Tristram has specimens from the Samoa group; and Messrs. Hartlaub and Finsch speak of it from the Pelew Islands (where it breeds), from the Stewart group, and likewise from Ualan, one of the eastern Caroline islands.

Habits.—The Tropic-birds are well-known attendants on vessels while passing through warm latitudes, as their inquisitiveness causes them, particularly at nights, to hover about the mast-heads; sometimes they will fly round the vane and now and then peek at it, and on still moonlight nights, in the Indian Ocean, I have seen them sitting on it for half an hour together. The present species does not differ in its nature from its larger and better-known relative, the Red-tailed Tropic-bird; and some of the individuals which I saw about the ship at night during a recent voyage down the Indian Ocean most probably belonged to it. These birds are fearless, and will approach close to a vessel in the daytime. They dwell much on the open ocean, and are possessed of great powers of flight. They usually fly with the bills pointed downwards, often hovering for a while, and plunge rapidly on their prey like a Tern, not immersing more than the head and neck in the water; their plump form and lengthened pointed tails give them a graceful appearance on the wing, and the motion of their wings, which is rapid and regular, adds to the attractiveness of their appearance. Notwithstanding, however, that "Bo'sun" birds are found so much at sea, numbers are resident about the islands where they breed, and there subsist largely on crabs; at sea they are often to be seen dropping on flying-fish, and probably pick up various floating matter, as do Petrels. The name of "Boatswain-bird" is applied by sailors to these birds on account of a fancied resemblance in the tail to a marling-spike, which is one of the most important of a boatswain's stores.

The Boatswain-bird walks with difficulty. Jones, in his account of the natural history of Bermuda, says it "rests its breast on the ground, and shuffles along in an awkward manner, spreading its wings partially."

Nidification.—The nearest nesting-place of this species to Ceylon is probably to be found in the Seychelles group. Here Mr. E. Newton found a nest on Mahé in January; it was situated in a hole in the dead stump of a "capuein," about 15 feet from the ground, and contained a young bird, the produce of the single egg which these species always lay. At Ascension Mr. Gill, as recorded by Mr. Penrose (*loc. cit.*), found it breeding on "Boatswain-bird Island," so called from the large numbers of Tropic-birds which always nest there. It was scarcer than the larger barred species, *P. æthereus*, and was nesting in holes on the side of the island. Like its congeners it is very tame when breeding, allowing itself to be pulled out of its nest, but biting vigorously notwithstanding. An egg which Canon Tristram has kindly lent me for examination has a reddish-white ground-colour, but is so much obscured by the brownish-red stipplings with which the whole egg is covered that it is scarcely visible; round the middle of the egg the speckling is somewhat coarser than at the ends; but at the small end the specks have the appearance of having run into one another, and this part is best described by saying it has a sedimentary look. In shape it is a stumpy oval, much broader at one end than the other, though neither are pointed, but, on the contrary, rather flattened. Its dimensions are—length 2·08, breadth 1·52 inches.

Canon Tristram kindly sends me the following interesting account, which I give here verbatim, of the nesting of this species at Bermuda:—"After a lapse of thirty-four years, Capt. Legge invites me to write my recollections of the breeding of *Phaëton flavirostris* in Bermuda. Premising that I have only the stores of memory, not of note-books, to which to refer, I cannot give exact dates of days of month &c., which, however, have, I believe, been supplied by my friend Mr. Jones, in the 'Naturalist in Bermuda.' All through the winter months and the early spring not a Tropic-bird is ever seen round the islands. They muster, on a sudden, towards the end of April; and then for three months they are the ornithological feature of the still vexed Bermoothes. Their arrival is not a silent one. Noisy as Swifts they dash and sweep and sail round cliffs and headlands with their wondrously graceful flight. In a few days they seem to have decided on their respective ledges, much after the fashion of Rooks in an English park. Each pair select a little ledge with a hole in the soft limestone cliff, if they can find one; if not, they content themselves with a shallow scooped niche, always,

however, taking care to have a good platform in front. I have taken the eggs at depths varying from 2 to 4 feet in the rock. The *Phaëton* never appears to lay more than one egg, of a character which clearly separates the genus from all other Steganopodes; and I have observed that, as a rule, the eggs of *P. flavirostris* are more invariably richly coloured, and supply very rarely a pale or shabbily-washed surface, like those of *P. rubricauda*. The female sits assiduously, and is fed during incubation by her mate. The young are naked when hatched, and, to judge by the constant visits of the parents, have a voracious appetite. It is curious to watch the parents clinging to the cliff after the manner of a Swift, and coaxing the young bird forward to receive the little fish from its bill, while her tail is expanded widely against the face of the rocks, the two or three long central feathers forming a fine train. The young are first covered with white down, but the adult plumage is rapidly assumed. When first persuaded to take the water, the young have much difficulty in rising, and I have more than once run them down on the sea and captured them from a sailing-boat. For several weeks they seem to return to their breeding-places to roost, and then, when the nestling down has been all cast, the whole colony disappears on a sudden in August, and not a straggler was ever seen till the following spring. The soldiers were great adepts at capturing them by night on their nests; and my friend Mr. Hendri and myself, having once incautiously offered a shilling apiece for specimens, we were invited next morning by the sergeant to visit the lighthouse on Gibbs's Hill, where over 100 birds were incarcerated in a dark cellar, more than half dead with fright and exhaustion, and an equal number of eggs were displayed on the lighthouse-keeper's table. I speak of more than thirty years ago. But, alas! I am told that whereas formerly the Tropic-birds might be reckoned by thousands, the numbers who return in spring can now be reckoned on the fingers; and Bermuda, as a breeding-place, will soon be among the traditions of prehistoric ornithology."

STEGANOPODES.

Fam. PELECANIDÆ.

Bill straight, the tip hooked in all but one genus (*Sula*); nostrils basal, exceedingly small; throat furnished with a pouch, more or less developed. Wings long, with the ulna much lengthened. Tail moderate, stiff in some. Legs short and stout; the tarsus less than the middle toe, which is shorter than, or only as long as, the outer; all four toes connected by a full web.

Sternum with an open, shallow, and wide indentation on each half of the posterior margin; furcula joined to the keel, which rises from the anterior portion of the sternum.

Genus SULA.

Bill straight, conical, pointed at the tip, which is straight, the edges of the upper mandible near it being serrated; gonys short and pronounced; upper mandible with a narrow groove near the culmen; gap wide, the edge of the upper mandible adjacent to it inflated; nostrils basal, very narrow, and almost invisible; culmen flattened at the base; facial skin and throat at base of bill bare. Wings long and pointed, the first two quills the longest. Tail long and cuneate, varying in the number of feathers. Tarsus shorter than the middle toe, broad and reticulate in front, keeled behind; the outer and middle toe equal, but the middle claw much larger than the outer, and slightly serrated.

Sternum with one wide conical notch in each half of the posterior margin; keel united to the furcula by a close joint.

SULA LEUCOGASTRA.

(THE BROWN GANNET.)

Sula sula, Linn. Syst. Nat. i. p. 218 (1766).

Sula leucogastra, Bodd. Tabl. Pl. Enl. p. 57 (1783); Sclater & Salvin, P. Z. S. 1878, p. 651.

Sula australis, Steph. *apud* Hume, Str. Feath. 1877, p. 318, et 1878, p. 493 (List B. of Tenass.), et 1879, p. 116 (List B. of Ind.).

Sula fiber (Linn.), *apud* Gould, B. of Austr. vii. pl. 78 (1848); Blyth, Cat. B. Mus. A. S. B. p. 296 (1849); Jerdon, B. of Ind. iii. p. 851 (1864); Holdsw. P. Z. S. 1872, p. 482; Salvadori, Ucc. di Born. p. 389 (1874).

Dysporus sula (Linn.), David & Oustalet, Ois. de la Chine, p. 530 (1877).

The Booby of sailors; *Dusky Gannet* of some.

Adult female (Laccadives). Length 31·7 inches; wing 16·1; tail 8·0; tarsus 2·0; bill from gape 5·1, at front 4·1 (*Hume*).—*Adult*. (Pacific) Length 32·9 inches; wing 16·96; tail 8·21; tarsus 1·83; middle toe 2·73 (*Finsch*). (Tenasserim: Brit. Mus.) Wing 16·5; tail 7·0; tarsus 1·86; middle toe 2·95; bill to gape 4·3, at front 3·6. (West Indies: Brit. Mus.) Wing 15·1 inches; tail 8·0; tarsus 1·7; bill at front 3·76. (Locality?: Brit. Mus.) Wing 15·7 inches; tarsus 1·8; middle toe 3·05, claw (straight) 0·49.

Note. This species has 14 tail-feathers.

“Iris white; bill creamy white, with a bluish tinge in veins; pouch, gape, lores, and orbital spaces pale hoary greenish yellow; legs and feet pale yellow, with a greenish tinge on tarsi; claws white, with a bluish tinge” (*Hume*).

“Iris very pale yellow; bill and orbits primrose-yellow, blotched before and beneath the eye with pale bluish; eyelash light ash-grey; legs and feet pale yellow” (*Gould*).

Adult (British Museum). Head, entire neck, and upper surface glossy chocolate-brown, paling round the bill in some specimens, whilst in others the head and neck are darker throughout than the back; wings and tail blackish brown; from the chest to the under tail-coverts, including the flanks, pure white, the longer under tail-coverts tipped with brown; axillaries white; under wing brown, with a white band formed by the median coverts.

Young. The nestling is covered with brownish down, darker on the back than on the chest; but when first hatched the young are naked.

Immature (Ceylon). Iris bluish white; bill pale bluish, orbital skin and round the gape tinged with green; legs and toes greenish yellow; webs yellow, claws dusky. Face not bare beyond the posterior angle of the eye.

Entire upper surface, head, and neck, down to the centre of the chest, uniform pale sepia-brown; under surface from the chest pale brownish, defined against the dark colour of the fore neck by a distinct line across the chest; axillaries and a bar across the under wing white; the bases of the feathers of the under surface whitish.

An example received alive in February was in the above plumage, corresponding to other specimens I have examined. In April the head and neck began to darken, blackish-brown feathers appearing among the sepia-brown plumage; at the same time the white feathers of the under surface began to appear, the scapulars and tail-feathers were moulted completely in a month, and in May the under surface was mingled white and brownish; the bird was in bad condition owing to confinement, and was consequently moulting the clothing-feathers slowly and imperfectly; had it been in a state of nature the complete white under surface would have been acquired during the season in question.

An example in the British Museum, labelled “Tenasserim,” has the head and neck uniform brown, but the feathers of the back tipped with whitish, conspicuously on the rump, where it forms a whitish patch, and also across the lower part of the hind neck, forming there a pale band; the underparts white, extending somewhat up the middle of the throat; some of the feathers of the fore neck are tipped with white. This specimen is not quite mature.

Obs. This Gannet belongs to a section of the genus *Sula* for which the title *Dysporus* is adopted by some writers; but the type of this genus of Illiger's appears to have been another species with different characteristics, namely the common European Gannet (*Sula bassana*, Linn.); and I agree with Mr. Hume that it cannot well be adopted. The characteristics of the section to which the present species belongs consist in the bare gular skin not extending down the throat as a stripe more or less extended, but terminating in a curve across the chin.

In the Atlantic and on the coasts of South America the White-breasted Gannet assumes a smaller form, which some writers separate from, and others unite with, the present. According to the former, it is the *Sula parva* of Gmelin (Syst. Nat. i. p. 579). A male procured by Von Pelzeln near Rio Janeiro measured—total length only 21 inches.

Distribution.—This well-known bird (the "Booby" of sailors) is a casual visitor to the coasts of Ceylon, being, however, generally seen on the western side of the island. Mr. Holdsworth, the first naturalist to record it from our region, writes thus of it:—"In February and March 1868 I had many opportunities of watching a pair of Boobies which frequented the neighbourhood of the Aripu pearl-banks, about ten miles from the land. They used often to perch on a large iron buoy close to my usual anchorage at night. I only saw them during that one season." In 1871 I saw an example of this species myself sitting on a buoy at the entrance to Galle harbour; and in the same locality Capt. Wade-Dalton, of the 73rd Regiment, has seen several, being likewise the possessor of a specimen which flew against the lighthouse at Galle and was killed. At the latter end of 1875 or beginning of the following year the immature bird above described was captured near Kalutara (Caltura), and kindly given to me by my friend Sir Charles Layard, into whose hands it had passed. A second immature example was seen by me on the 19th December, 1876, flying about the Colombo Roads, and finally settling on the "Druken-Sailor" buoy near the fort. Since my departure from the island a further example, now in the Colombo Museum, was procured at Kalutara.

This species is widely spread, inhabiting the entire tropical zone, and wandering north and south from it. In the Bay of Bengal Mr. Hume has noticed it, and it is numerous between Penang and Singapore, near the Cocos Islands and Preparis Island, or in that part of the Bay between the Andamans and Burmah. He likewise records it from the Laccadive group, where he saw it at the Cherbaniani reef and near Pere-mull-par. It occurs at the Seychelles, and is occasionally seen as far south as the Mauritius, frequenting also the tropical portion of the east coast of Africa and portions of the Red Sea. In the Atlantic it is found at St. Helena and Ascension, breeding in considerable numbers at Boatswain-bird Island. In the West Indies it has been noticed at the Windward Islands and on the coast of Venezuela; and from Honduras Mr. Salvin records it.

Turning eastward of the Bay of Bengal we find it recorded from Formosa and Shanghai by Swinhoe; and northward of the latter place Père David says he has not seen it, notwithstanding a species of Gannet is included in the 'Fauna Japonica' by Temminck and Schlegel under the name of *S. fusca*, which may have been this species. To the Philippines it appears to be a rare straggler: Cuming procured it in the island of Mindanao; but Mr. Everett and recent collectors have not met with it in this group. It is found among various islands in the Pacific, among which the Fiji group may be mentioned, whence Hartlaub records it. On the north coast of Australia and about Torres Straits it is not uncommon; and I observe that Mr. Ramsay, in his list of Australian birds, notes it from Cape York, the Gulf of Carpentaria, and Port Darwin, as also from the south coast of New Guinea. Salvadori records it from Sumatra, Borneo, Celebes, Ternate, Amboina, and New Guinea; and recently Herr Meyer speaks of a specimen having been brought from Minahassa, in Celebes.

Habits.—This species does not appear to lead the active life which makes the various species of White Gannet so conspicuous; it has not the same vigorous, rapid flight, every now and then plunging from great heights like a thunderbolt into the sea, which, when sailing in the Cape or Australian seas, one cannot fail to notice at once in the case of *Sula serrator* or *S. capensis*; but it appears to fly leisurely along, nearer the water than these its congeners, now and then *sweeping* down after some unlucky fish. While affecting the vicinity of the shore it frequently sits on small rocks or on some isolated buoy, which kind of perch it invariably chooses when it is to be had. Its favourite food in the tropics seems to be flying-fish, which it may often be seen chasing, flying after them and dashing on them in a slanting direction. It not unfrequently comes on board ship at night, perching usually on the extremity of the yard-arm, and while taking its rest

now and then twisting its head stupidly from side to side, which habit no doubt has given rise to its name of Booby among sailors.

The example which I kept in confinement was a greedy bird, snapping up fish and pieces of meat, and devouring them like a Cormorant as rapidly as I threw them in to it. It perched much on an upright stone which I had placed in the ground for the purpose, but now and then it betook itself to a lower perch and sat upright; but sometimes it placed itself in a position of ease by resting the centre of its breast on the stake, and thus balanced its body in a horizontal position, with the neck held out straight. It walked well, taking short strides, but without the waddling gait which one would have expected from the backward position of its legs. Its voice was a hoarse harsh creak, reminding one of the creaking of a heavy gate on rusty hinges! While moulting, particularly when its neck lost many of the feathers, bare places being visible here and there, it seemed unable to swallow, and shook its food out of its bill with a jerking motion of the head; this continuing for some time, it became very dull, and one day, while poking its head through the bamboos into the adjoining aviary, a Sea-Eagle which occupied the next compartment seized it by the neck. After this, though it had really sustained no injury, it pined, and its eyes gradually closed up, until I was obliged to put an end to its unhappy existence.

Dr. Cunningham, in his exhaustive notice of the Common Gannet or Solan Goose (*S. bassana*), says (Ibis, 1866, p. 13):—"The name Gannet is intimately connected with our modern English Gander, both words being modifications of the ancient British 'gan' or 'gans,' which is the same word with the modern German 'Gans,' which in its turn corresponds with the old High German 'Kans,' the Greek $\chi\eta\nu$, the Latin *anser*, and the Sanskrit 'hansa,' all of which possess the same signification, viz. a Goose."

Nidification.—This widely-distributed Gannet breeds at certain fixed localities throughout the tropical portions of the globe. Its nearest breeding-station to Ceylon may perhaps be in the Malay archipelago; but it is known to nest at Rodriguez, and also in the Red Sea, as Von Heuglin was informed by Arab fishermen that there were colonies on the islands of the Dahlak archipelago; but he did not visit them himself. On Boatswain-bird Island this Gannet breeds in considerable numbers. According to Mr. Gill it nests on the top of this rocky islet, and also on some isolated rocks off the north-west corner of Ascension. The single egg is laid on the bare ground, and is chalky white in colour.

An egg of this Gannet, kindly lent me by Mr. F. G. Penrose, and taken at Boatswain-bird Island, is an oval, somewhat pointed at one end; the exterior of the shell is chalky white and the texture rather smooth; beneath, the shell shows pale green where the chalky material has been scratched off. It measures 2.66 by 1.73 inch. Other specimens, belonging to Canon Tristram, the loan of which I have been favoured with, are of similar shape and texture, but vary in width; two measure 2.4 by 1.5 and 2.38 by 1.57 inch.

SULA CYANOPS.

(THE YELLOW-EYED GANNET.)

Sula cyanops, Sund. Phys. Sällsk. Tidsk. 1837, p. 218; Heuglin, Orn. N.Ost-Afr. ii. p. 1480 (1873); Salvadori, Uccelli di Born. p. 367 (1874); Hume, Str. Feath. 1877, p. 307, et 1879, p. 116 (List B. of Ind.).

Sula personata, Gould, P. Z. S. 1846, p. 21; id. B. of Austr. vii. pl. 77 (1848).

Dysporus cyanops (Sund.), Finsch & Hartlaub, Orn. Centr.-Polyn. p. 252 (1867).

The Masked Gannet, Gould.

Adult females (Raine Island; 'Challenger' Exp.). Wing 15·7 to 16·0 inches; tail 7·0 to 7·5; tarsus 2·2 to 2·3; outer toe and claw 3·5; bill at front 4·1 to 4·2, to gape 5·2.—*Male and female* (Mekran coast). "Length 32·0 to 33·0; wing 16·5; tail 7·25 to 7·5; bill at front 4·0 to 4·06; bill to gape 4·12 to 5·0" (*Butler*).—*Adults* (Red Sea). "Length 30·7 to 31·8; wing 17·8 to 18·1; tail 7·67 to 8·77; tarsus 2·1 to 2·2; bill at front 4·12, at gape 4·93" (*Heuglin*).

Note. This species has 16 tail-feathers.

Iris yellow, reddish yellow, or greenish yellow; bill yellow or greenish yellow; loreal and facial skin dark slate-colour; legs and toes dark slaty or plumbeous; webs darker.

Obs. Mr. Hume, in his valuable notice of this species (Str. Feath. 1877), gives a list of the descriptions of the "soft parts" of this species by various authors, to show how much they vary. The discrepancies, however, as regards what are presumed adults, in his table do not appear to be greater than one would expect in the case of birds of perhaps different ages from widely distant localities. The four specimens last in the table are evidently all immature. Mr. Murray, the naturalist of the 'Challenger,' describes the soft parts of the Raine-Island specimen as follows:—"Iris yellow; skin of the throat black; legs and feet slate-colour."

Adult female (Raine Island). Plumage white; the primaries and their coverts, greater wing-coverts and secondaries, as also the tips of the tertials and scapulars, brownish black; inner webs of the secondaries basally white; tail very dark brown, somewhat paler than the primaries, the basal portion of the feathers white, extending along the edges of the central pair; under wing white.

Young. The nestling is covered with white down (*file* Finsch).

Immature in first plumage. Iris dusky yellow; face and basal portion of bill blue, passing into olive at the tips; legs and feet olive, the webs darker. "Plumage uniform greyish brown" (*Finsch*).

In the succeeding stage the plumage is white, more marked with dark colour than the adult.

The following is a description of an immature example procured in Ceylon in the month of April:—Length 32·0 inches; wing 17·0; tail 9·0; tarsus 1·9; middle toe and claw 4·0; bill to gape 5·3.

Bill blackish at base and tip; the remainder in the dried specimen reddish, probably yellow when living; legs and feet black.

Plumage white, tinged with salmon-colour beneath; the primaries, secondaries, wing-coverts, primary-coverts, scapulars, and tail dull black, the following parts being white, *e.g.* the inner webs of the longer or underlying scapulars, also of the secondaries and the primaries to within 3 or 4 inches of the tips, and likewise the bases of the wing-covert feathers; upper tail-coverts with a drop-shaped black patch near the tips of the feathers.

Captain Butler records the soft parts of specimens in immature plumage shot on the Mekran coast as follows:—Iris pale green (?); bill pale bluish horny; bare skin of face and chin slate-colour; feet lavender-blue. The colour of the iris is here at variance with that noted by any other naturalist; and one is almost inclined to think that the specimens have been wrongly identified.

Obs. *Sula piscatrix*, Linn., which is found in the Malay archipelago, may perhaps occur as far north as Ceylon. It has the *legs and feet red*; bill and facial skin light blue. Plumage white, with the head and neck tinged with buff; primaries, greater coverts, and secondaries brown, tinged with grey; edge of the under wing brown. Wing 14·5 to 16·4 inches. These notes, except the dimension of the wing, are taken from a Torres-Straits specimen.

Sula capensis, Licht. (the Cape Gannet), is white, with the *entire tail* and the quills and greater wing-coverts brown. It does not appear to stray north of the Mozambique channel. Wing 18·0 inches; gular space extending in a narrow stripe down the centre of the throat.

Sula serrator (*S. australis*, apud Gould, P. Z. S. 1840, p. 177) is a magnificent species, frequenting the Australian seas, and is one of the showiest birds on the wing and boldest fishers of the whole genus. It has only the *four central tail-feathers* and the quills (none of the wing-covert feathers) black-brown. A specimen in the British Museum measures in the wing 17·5 inches.

Distribution.—An example of a white Gannet, which I identify as belonging to this species, was sent home for examination, about a year ago, by the Director of the Colombo Museum. It was brought to him by a native of Puttalam, who stated that he had caught it there in the month of April 1878; and if this statement be correct, the bird was probably driven on shore in a gale of wind. No other example of the species has been, to my knowledge, met with in the island.

This Gannet inhabits the southern parts of the Indian Ocean, and is not uncommon in the Malay archipelago and about the Coeas Islands, whence it wanders north, approaching the Mekran coast, where Captain Butler procured specimens in May 1877. Von Heuglin met with it on the Somanli coast, at Ras Hafun and Socotra, and on the island of Kuria Muria. Captain Shelley includes it in his 'Birds of Egypt,' on the authority of Mr. E. C. Taylor, who met with it near Suez. It is found in the tropical parts of the Atlantic, breeding at Ascension on Boatswain-bird Island, near which place I have seen it in considerable numbers myself.

Eastward of Ceylon it is apparently more abundant, for in the Malay archipelago Salvadori records it from the Straits of Sunda, the coast of Borneo, and Torres Straits; and in the latter locality it was found breeding at Raine Island by the 'Challenger' expedition; while Mr. Ramsay records it from Port Darwin and Cape York, southward of which it extends to the Wide-Bay district, New South Wales, Victoria, and South Australia. It has been found in various places in Polynesia, including the Sandwich Islands, the Paumotu and Phoenix groups, and M'Kean's Island, Gräffe having procured it at the two latter places, and Peale at the second named, while Salvadori records it from the first mentioned. Eastward still it has been noted from Peru and the coast of Chili.

Habits.—This fine Gannet, like the Australian and Cape species, is a showy bird on the wing and possessed of great powers of flight. The only locality where I have seen it myself was at Ascension; and I had there an opportunity of seeing it chased by Frigate-birds, and display all the speed that it was capable of in trying to evade its rapacious adversary. It flies with very rapid strokes of the wings, and keeps at a good height above the water when proceeding from place to place. It descends on its prey almost perpendicularly, and plunges with great velocity into the water, almost disappearing beneath the surface in the force of its descent.

Nidification.—The Masked Gannet appears to have a permanent breeding-station in Raine Island, Torres Straits, as several naturalists have found it there at the nesting-season. Gould describes eggs taken from this place as "rather lengthened in form; dirty white, stained all over with reddish brown; dimensions $2\frac{3}{8}$ inches long by $1\frac{3}{4}$ broad." It likewise nests at Lord Howe's Island, whence Canon Tristram has specimens, one of which, kindly lent to me, is sullied white, with a bluish-green shell, from which the chalky texture has been considerably removed; this is an ellipse in shape, and measures 2·66 by 1·71 inch. In the Atlantic it breeds on the top of Boatswain-bird Island, at Ascension, in company with the Brown Gannet; here its single egg is laid on the ground.

Genus PHALACROCORAX.

Bill with the culmen flat and the tip suddenly bent down perpendicular to the direction of the ridge; a long narrow groove running from the nostril near the culmen to the commencement of the curve; nostrils basal, linear, concealed beneath the loreal skin; sides of the under mandible flexible, and only joined at the tip by a bony arch, up to which the gular pouch extends. Wings with the 2nd quill the longest, and the 1st and 3rd subequal, the inner webs of the 1st and 2nd notched. Tail rounded, the feathers very stiff, and the laterals graduated. Tarsus short and much compressed, the inner side with a rim of transverse scales, the front and the outer side reticulate. Toes flattened, the outer longest, much exceeding the tarsus, and with four joints; hind toe reversible to the front.

PHALACROCORAX CARBO.

(THE COMMON CORMORANT.)

Pelecanus carbo, Linn. Syst. Nat. i. p. 216 (1766).

Phalacrocorax carbo (Linn.), Leach, Syst. Cat. M. & B. Brit. Mus. p. 34 (1816); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.); Dresser, B. of Eur. pts. 73, 74 (1879).

Phalacrocorax novæ-hollandiæ, Steph. in Shaw's Gen. Zool. xiii. pt. 1, p. 93 (1825).

Graculus carbo (L.), Blyth, Cat. B. Mus. A. S. B. p. 298 (1849); Jerdon, B. of Ind. iii. p. 861 (1864); Salvadori, Uccelli di Borneo, p. 364 (1874); Hume, Nests and Eggs, iii. p. 659 (1875); Scully, Str. Feath. 1876, p. 204; Oates, ibid. 1877, p. 169; Hume, ibid. 1878 (B. of Tenass.), p. 496.

Corro marinho, Portuguese; *Aalscholver*, *Schollevaar*, Dutch. *Ghogur*, *Pan-kowal*, *Pan-kowa*, Hind.; *Bonta-kaki*, Telugu; *Khara ghaz*, lit. "Black Goose," Khasghar (Scully); *U*, Japanese; *Aqaq*, Arabic.

PHALACROCORAX FUSCICOLLIS.

(THE ASIATIC CORMORANT.)

Phalacrocorax fuscicollis, Steph. in Shaw's Gen. Zool. vol. xiii. pt. 1, p. 91 (1826); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Graculus sinensis (Shaw), *apud* Blyth, Cat. B. Mus. A. S. B. p. 298 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 802 (1864); Holdsw. P. Z. S. 1872, p. 483; Hume, Nests and Eggs, iii. p. 660 (1875); Butler & Hume, Str. Feath. 1876, p. 33.

Graculus fuscicollis (Steph.), Oates, Str. Feath. 1877, p. 170.

The Chinese Pelican, Shaw, Nat. Miscell. xii. pl. 529 (1790-1813).

Brown-necked Shag, Lath. Gen. Hist. x. p. 425.

Adult (India). "Length 24 to 27 inches: wing 11, expanse 36 to 40; tail $5\frac{1}{4}$ to 6; bill at front $2\frac{1}{4}$; middle toe $2\frac{3}{4}$." (Jerdon.)

Adult female? (Ceylon). Length 32.5 inches; wing 12.5; tail 6.5; tarsus 2.1; outer toe and claw 3.8; bill to gape (straight) 3.5.—*Adult males* (Burmah). Length 32.0 to 32.7 inches; wing 13.3 to 13.6, expanse 51.0 to 52.0; tail 6.8 to 7.5; tarsus 2.3 to 2.4; outer toe and claw 3.8 to 4.0; bill from gape 3.85 to 3.95 (*Oates*).—*Adult males* (Kashgharia). Length 32.8 to 33.0; wing 13.7 to 14.0, expanse 55.5 to 57.3; tail 7.8 to 8.3; tarsus 2.1 to 2.2; bill from gape 3.8 to 3.9; weight 4 lbs. 10 oz. to 4 lbs. 2.25 oz. (*Scully*).—*Adult male and female* (Wales, ten examples). Length 33.2 to 36.0 inches; wing 13.0 to 14.5, expanse 55.0 to 58.0; tail 6.54 to 7.0; tarsus 2.4 to 2.7; outer toe and claw 3.8 to 4.3; bill to gape (straight) 4.0 to 4.3; average weight $6\frac{3}{4}$ lbs., varying from $6\frac{1}{2}$ to $7\frac{1}{4}$ lbs.

Notes. Occasionally very large birds are met with; one was shot some years ago near Aberystwith weighing 10 lbs., and recorded in the 'Field.' The weight given by Dr. Scully is very low. There are 14 feathers in the tail of this species.

Breeding-plumage. Iris bright emerald-green; loreal skin black, extending about 0.2 inch below the eye, from which line to the gape the skin is orange-yellow; gular skin black, with pale yellow specks, or yellow-grey with yellow specks; bill blackish, sides of lower mandible flesh-colour, darkening towards the tip; legs and feet black.

Male (March; Craig y dorn, Wales). Head, neck, centre of the interscapular region, back, rump, upper tail-coverts, entire under surface, and under tail-coverts glossy black, with a greenish hue; a sharply defined white gorget bounding the gape and pouch, and running out into the centre of the latter passes round to the orbital skin, terminating there, its general width being about an inch; down the centre of the occiput and nape there is a line of elongated feathers about $1\frac{1}{2}$ inch in length, forming a comb-shaped crest; the front of the crown, as also the sides (leaving a narrow streak down the centre of the occiput, on which the crest lies, and a broad space above the eye, which passes down beneath the gorget), together with the hind neck and throat for a distance of about 5 inches down, are overlaid with a close striation of narrow, silky, filamentous white feathers; the feathers of the shoulders, sides of the chest, the scapulars, tertials, and wing-coverts glossy brownish bronze, with clearly defined black margins and black shafts; primaries black, pervaded with grey; outer webs of secondaries bronzed greyish, with black edges, inner webs blackish grey; tail black, the shafts of the feathers grey; overlying the thighs a conspicuous patch of white feathers; under wing black.

In Great Britain and probably throughout temperate Europe the silky neck- and head-feathers, together with the white thigh-patch, are donned in February and put off again in May; out of hundreds of birds which I closely examined in Wales in June very few had the thigh-patches left, and not very many had more than a few scanty white filaments round the throat; none had any on the head, as these commence to be shed first, and are all gone by the middle of May; at the same time the white gorget undergoes an almost complete change of colour, becoming brownish grey above the gape and round the edge of the black; this is acquired by a moult, but also, as far as I can observe, by a change in the colour of some of the feathers; the chin remains white.

Obs. A specimen which had perhaps acquired this plumage unusually early has probably led Mr. Dresser to figure this dress as the *winter plumage*!

Note.—This species has 12 tail-feathers.

"Iris verdigris-blue; nude orbits black; bill dusky brown, reddish beneath; gular skin yellow; feet black."

Winter plumage. "Head and neck shining black; feathers of the back and wing-coverts bronze-colour, as in the last; throat white, this colour extending towards the eye, and passing into pale brown on the cheeks; lower plumage deep black."

"In *breeding-plumage* this Cormorant assumes some white specks on the forehead and above the eyes, and a white tuft behind each ear; the chin, however, is then black." (*Jerdon*.)

Immature (Mt. Aboo, May). "Length 24.0 inches; wing 9.75; tail 5.5; bill at front 2.25, to gape 3.0.

"Iris green; upper mandible greenish black; lower mandible fleshy.

"Upper parts brownish black, slightly glossed with green; scapulars and lower hind neck silvery earthy brown, having many of the feathers, especially of the scapulars, bordered conspicuously with brownish black and finely edged with pale brown; wings and tail dark; wing-coverts brown, glossed with green; chin and upper throat

In Burmah, where this species breeds in large numbers, the white flank-spot is said by Mr. Oates (and, I apprehend, the filamentous feathers too) to be acquired in September (the eggs being laid in October) and doffed again in the beginning of December. In the north-west of India, Mr. Doig saw many specimens which had lost the white neck-plumes in November, but still retained the thigh-spot. A specimen shot in January at Jaffna has the neck, but not the head, covered with the white feathers and a scanty white flank-spot; from the distribution of the remaining feathers they are apparently being doffed, and not donned, so that the bird would appear to have bred at some place not far distant.

After the disappearance of the white neck- and flank-feathers the ground-colour of the pouch appears to get paler, and the entire skin becomes yellow, these differences constituting the *winter plumage*.

Young (callow nestling males). Skin blackish slaty, the crown reddish, but the skin round the closed eye bluish, with a dark streak over the eye; bill—upper mandible dusky fleshy, a white spot at the curve of the tip, behind which there is a black patch; tip of the under mandible blackish, the remainder with the pouch yellowish fleshy; legs and feet fleshy yellow, the claws black; the tibial skin concolorous with that of the body.

In about a fortnight the young are covered with down. The iris is then grey, tinged with greenish; forehead naked, the skin bluish or fleshy grey; the culmen and edge of lower mandible black-brown, the tip pale fleshy; remainder of bill fleshy, yellowish next the pouch, which is fleshy yellow; front of tarsus and top of toes dark brown; rest of legs and webs fleshy yellow. The down is sooty black above and beneath; occasionally individuals have patches of white down on the under surface. At this period the young are about the size of a small Duck, but the body is longer. The average weight of six examples was $2\frac{1}{2}$ lbs., some weighing as much as $2\frac{3}{4}$ lbs.

On leaving the nest the bird is in the plumage of the first year, during which period the full dimensions are attained. Examples in the flesh, about one year old, measured—Length 35.5 to 36.0 inches; wing 13.5 to 14.0, expanse 57.5; tarsus 2.5; outer toe 4.5; bill to gape (straight) 4.2 to 4.5; weight of a male 7 lbs.

Iris pale grey, sometimes tinged with greenish; orbital skin brownish yellow; loreal skin dull greenish yellow; gular pouch entirely gamboge-yellow; bill as in the adult, as also the legs.

white; neck mottled brown and white; from neck to vent brownish black, with a good deal of white on the breast and abdomen, the latter almost all white in the region of the belly; thigh-coverts, like the back, black, glossed with green; lower tail-coverts dark brownish black; under wing-coverts and flanks brownish black." (Butler.)

The *nestling*, as in the last species, is in all probability covered with blackish down.

Obs. Never having procured this species while in Ceylon, and being unable to detect specimens in the British Museum, or in any collections to which I have access in England, I have been, I regret to say, obliged to transcribe the entire descriptions from the writings of other naturalists. There is a mounted specimen in the British Museum of an immature Cormorant, of rather diminutive size, from China, which at first sight might be taken for the present species; but it is, in my opinion, merely a rather small example of the last. The wing measures 12.8 inches; tail 7.0; bill to gape 3.5; tarsus 2.0. Neither Swinhoe nor David include this species in the avifauna of China, and it is therefore probable that the *P. sinensis* of Shaw was nothing more than the Common Cormorant.

Distribution.—This species, so far as I could ascertain, is a rare bird in Ceylon. Layard remarks that he saw a few on the fishing-kraals in the Jaffna estuary in company with the next species. Mr. Holdsworth did not meet with it at all; and although I have seen at a short distance a few birds which I identified at the time as the Lesser Cormorant, I have never shot it. On one occasion I met with a pair of Cormorants which were perched on stakes in the Tamara kulam, near Trincomalie, which were intermediate in size between the large and small species, and which were near enough for me to discern that they were in immature plumage; at other times I have seen similar birds in one or two tanks in the interior; and I have no doubt that they all belonged to the present species. It is well to remark, with regard to Layard's identification, that the birds he saw on the *estuary* (salt water) near Jaffna may have been examples of the Common Cormorant, which was at that time not known to visit the island. As I cannot ascertain that specimens have ever really been procured, I place this species in a footnote article.

Jerdon speaks of this Cormorant being equally widely distributed in India with the last, and even more generally spread than that species, he having procured it in the Carnatic, Tickell in Central India, and Blyth in Bengal and Burmah. Mr. Hume, however, writing in 'Nests and Eggs,' takes exception to this statement, and at the time he writes

A Ceylonese example (January) is as follows :—Head, neck, and throat brownish black, darkening to black, glossed with green, down the centre of the hind neck; the feathers of the head narrowly edged with greyish buff, the edgings increasing in width on the sides of the upper neck and down the throat, where the bases of the feathers are pale tawny; the broad white gorget extends up to the ear-coverts, where it darkens into pale brownish, and round the lower edge it blends into the dark colour of the throat; the back and rump are black, as in the adult; the light scapulars, interscapular feathers, and wing-coverts are pervaded with grey, some of them having a dull bronzy tinge, and the margins are not so intensely black as in the adult; the quills are the same; flanks and sides of the breast black, glossed with green; the centre of the breast and chest are mixed blackish brown and whitish, tinged with ochreous, the tips of the feathers only being blackish, and the remainder ochreous, passing into white at the bases; under tail-coverts greyish, margined with black; on the upper hind neck and about the head there are a few white "points."

An example shot in Wales in October, probably in the 2nd year, is much blacker on the head and down the hind neck, the pale margins being very fine indeed; the scapular and wing-covert feathers are more bronzed in colour, but they extend, as in the immature Ceylonese specimen, higher up the hind neck than in the adult; the fore neck is darker, but the centre of the under surface is whiter than in the aforementioned specimen; the nape and upper part of the hind neck and its sides are striated with very fine white filaments, which would therefore appear to be put on in the second winter, irrespective of the larger white plumes, which would be donned in the following February with the black plumage; on the thighs there are indications of white patches in the shape of a few small short white feathers. I have seen numbers of examples shot in June (just one year old in Wales) without a sign of any of these small white feathers on the neck or thighs, so it is clear they are not assumed until the second year; and then they are not of the same character as those of the breeding-plumage, which is, as far as I can ascertain from numerous observations made in Wales, put on, but perhaps not in all cases, in the second March by birds hatched in May and June.

Obs. As will be observed, this species varies considerably in size, the smallest race existing in India and China.

(1875) says that he had never seen a live specimen nor a skin ever from the north-western parts of India (Sindh, Rajpootana, &c.). He records it, notwithstanding, from Lower Bengal and the countries eastward, and from Jhansi, where Mr. Blewitt found it breeding. In Chota Nagpur Mr. Ball met with it at Lohardugga and the Rajmehal hills; and in the above-mentioned region, from which Mr. Hume excludes it, it has been observed by Captain Butler at Mount Aboo and in the plains of Guzerat; whilst Mr. Doig found it breeding on the Eastern Narra river in Sindh. In the Deccan Mr. Wenden observed it at Nulwar, and he thinks he saw it again in Sholapoor.

To the eastward of Bengal it is found in Burmah on the Pegu plains, and is there, according to Mr. Oates, as common as the larger species; in Tenasserim it is local, occurring only on the tract between the Salween and the Sittang.

As above remarked, I find no recent mention of its occurrence in China, and it is therefore uncertain whether its range extends eastward of Burmah.

Habits.—This Cormorant affects tanks, jheels, and large rivers more than the sea-coast; in fact all mention of occurrence in the various parts of India which it frequents relates to its being found on fresh water, and not on salt. It is said by Jerdon to be "generally met with in pairs or alone, but occasionally in flocks."

The examples I saw at Tamara kulam were drying their outstretched wings in the usual manner after fishing, and had taken up a safe position well out of shot; but, notwithstanding, on my emerging from the jungle they flew off, thus demonstrating their shyness.

Nidification.—In Burmah Mr. Oates found the Lesser Cormorant breeding in reeds in the Myitkyo swamp. At the latter end of July nearly all the nests had young birds, so that the nesting-time appears to be late in June. The nests were, writes this naturalist, made of the smaller side branches of reeds, and were flat at the top, converging to a point below; they were about 9 inches across and 6 deep, supported on a few bent reeds. The eggs were five in number, and resembled in colour those of the other species in India. Dimensions 1.92 to 2.15 inches in length by 1.27 to 1.4 in breadth.

Mr. Blewitt found this species breeding in low trees in flooded land in the Jhansi district; the nests were made of sticks, and contained four or five eggs; the average size of those taken was 2.1 inches by 1.4.

Mr. Dresser considers that American birds exceed European ones ; but the dimensions he gives of Bay of Fundy specimens (wing 14.4 inches, tail 8.0, tarsus 3.0, culmen 3.45) are, as regards wing and bill at any rate, by no means excessive.

Distribution.—The Common Cormorant is, I think, a more frequent visitor to the island of Ceylon than has been supposed, and, though it may not breed there, remains apparently (perhaps as an immature or non-breeding bird) during the entire year, as I have seen very large Cormorants, larger to the eye when seen at some little distance than the smaller species, on the Minery and Amblangoda lakes during the south-west monsoon. It has not been hitherto included in the Ceylon lists, but is, I am told, not uncommon during the cool season on the Jaffna estuary or lake, whence I possess fine specimens shot by Mr. Clarke and kindly given me by Mr. W. Murray. If the bird is as common on this lake as has been represented to me, it is no doubt to be found in other situations in the north, probably on the Palverainkadoo and Mullaitivu lagoons.

According to Jerdon it is found throughout India, but rare towards the south, being there found chiefly in rivers that run through forest ; in the north it is more common, he observes, especially in Bengal and on the rivers within the Himalayas. In Nepal I find Dr. Seully says it is found on the Trisul Ganga in November ; and Mr. Brooks met with it above Mussooree. It appears not to be recorded from the Deccan by any observer of late ; but further north and to the east it is found in Chota Nagpur on both hills and rivers : Mr. Ball notes it from the Rajmehal hills, Lohardugga, and Sirgnja. It does not appear to inhabit the neighbourhood of Calcutta nor the district of Furreedpore. But turning westward, I find that it is found in the Allahabad district, probably breeding there, and is common in suitable localities throughout the Sindh, Jodhpore, Guzerat, and Kattiawar regions, and that, as regards the province of Sindh, it abounds on the Muncher lake and on the Eastern Narra ; furthermore Mr. Hume noticed it all down the rivers Indus, Jhelum, and Chenab, to Kurrahee, whence along the Mekran coast it was found very plentiful. At the Sambhur Lake Mr. Adam notes it as rare ; and in Guzerat Capt. Butler says it is only a cold-weather visitant. Passing now beyond the Bay of Bengal, it is said to be common by Mr. Oates in the streams of the Pegu plain, though not noticed on the Pegu river ; it breeds in vast numbers also in the Myitkyo swamp. Further south in Tenasserim it is local, being found only on creeks between the Salween and the Sittang, westward of the latter stream, and also on the Tavoy river. It does not inhabit the Andamans or Nicobars ; but it is recorded from the island of Sumatra, and is doubtfully included by Salvadori in the avifauna of Borneo.

Beyond the Malay archipelago, in which, as a whole, its distribution seems as yet to be imperfectly worked out, it extends to Australia, New Zealand, and Tasmania, if we accept the verdict of Messrs. Finch and Sellegel that the antipodian bird is the same as ours. It occurs at Cape York, down the east coast to New South Wales and Victoria, and in Tasmania is very abundant, ascending the large rivers to the lakes, where Mr. Gould says it breeds. In the latter I have met with it on inlets and brackish lagoons. It is abundant in Western Australia, and in New Zealand is common on the coast and in tidal rivers. Turning now to the north, we find it recorded as common on the coast of China and in Formosa, but only found in the south in winter. Père David notes it likewise from the rivers in the interior. Further north it has been obtained on the coast of Mantchuria, and extends up to Kamtchatka ; in Japan it is very common on the coast of Yezo, and was found by Messrs. Blakiston and Pryer in great abundance at Tokio, as also far inland on streams in Yamoto. In Eastern Siberia it is plentiful in parts, though not so on the Upper Amoor ; it breeds on Lake Baikal, and appears on the rivers as soon as the ice breaks up. It is numerous in Dauria, and in Mongolia is abundant in the Hoang-ho valley and on Lake Dalai-nor. It arrives, says Prjevalsky, at Lake Hanka in March, and in Koko-nor at the same time. In Kashgharia, however, it is a permanent resident, writes Dr. Scully, who found it in August affecting mud cliffs at Tungtash in small parties ; and in Turkestan Severtzoff says it breeds in the north and north-west, but occurs on passage only in the south-west. In Southern Persia Major St. John met with it abundantly on lakes and rivers ; and Mr. Blanford says it is plentiful on the Caspian. On the coasts of Asia Minor it is also found, and in Palestine is abundant on the sea-board, according to Canon Tristram, visiting likewise the mouth of the Jordan.

In Greece it is very common, and breeds abundantly, write Messrs. Elwes and Buckley, on the Bosphorus and Sea of Marmora. On the northern shores of the Black Sea and on the Sea of Azoff it likewise breeds, and occurs, according to Artzibaseheff, a Russian naturalist, in incredible numbers at the mouth of the Volga.

In Central Russia it is a bird of passage chiefly, passing northwards to the White Sea, breeding there numerously, and likewise occurring in Finland and on the Baltic coasts. In Sweden Nilsson says that it is found in autumn and winter. Mr. Robert Collett informs Mr. Dresser that it is common on the Norwegian coasts, but occurs most numerous above the Arctic circle. Faber writes that it breeds in the north of Iceland; and in the Faroes it is common and resident. In North Germany it is plentiful; but it is less abundant in Poland than formerly. In Denmark Mr. Collin states that it used to nest in forests near the sea, but being so destructive to the fisheries it is now exterminated in many places, still retaining its hold, however, in some localities; it is, however, only a summer visitor to that country, although stragglers are said to remain on water which is open in winter. In Holland it used to be abundant; but since its favourite resorts have been drained, it has disappeared from there, and is only found in a few localities.

In Great Britain it is very abundant, frequenting the entire sea-board up to the extreme north of Scotland, and thence to the Hebrides and the Orkneys and Shetlands. Here and there, however, it is found in much greater abundance than in other places, keeping to a certain extent near its breeding-places, which are always situated near good fishing-grounds. It is, perhaps, on the whole less numerous on the east coasts than on the west, the latter furnishing it with better shelter and more numerous breeding-places. It used to breed at Flamborough Head; but Mr. Dresser states that it has been driven away from that station, and does not nest nearer to it than the Faroe Islands. It is plentiful on the Welsh coasts, and also on many parts of the Irish sea-board.

Turning towards Southern Europe I find that it is said to be partly migratory to France, but breeds at Boulogne and Dieppe. In Southern Germany it is also found, but not in abundance; it appears every spring in Bohemia, writes Dr. Fritsch in the 'Journal für Ornithologie,' but it is not allowed to settle there, so destructive is it to the fish. In Spain and Portugal it is common on the coasts, and also on some of the rivers; but it is chiefly a winter bird. In Sardinia Mr. Brooke says it is extremely common on the rocky parts of the coast, and in Malta and Sicily is also plentiful; but in the former island Mr. Wright says it is chiefly a winter visitor. It occurs in Tuscany, which is one of the comparatively few places where it breeds on trees, but throughout Italy is found chiefly, according to Salvadori, in autumn and winter. In Transylvania it is principally seen on the larger rivers in winter, and occurs on the Danube from Austria down to its mouth.

Passing now to the continent of Africa, I find Favier, as quoted by Col. Irby, stating that it is found on the coast of Morocco, as also on lakes and rivers, from December until February; it is, however, said by Loche to be resident in Algeria on large lakes. In Egypt it is, says Capt. Shelley (B. of Egypt, p. 295), very plentiful, and is more numerous on the Nile in winter than later in the season. Von Heuglin states that it leaves the Nile in March, that it is very abundant in Central and Upper Egypt, and not found south of Assuan. Its occurrence in South Africa does not appear to be perfectly substantiated, for Mr. Dresser states that the specimens Layard refers to in his 'Birds of Africa' prove to be the allied species, *Ph. lucidus*; Mr. Andersson, however, in the 'Birds of Damara Land,' says that it is not rare in Walwich Bay; and if so, there is no reason why it should not extend to the Cape.

Lastly, the Cormorant is an inhabitant of the Atlantic coasts of North America. It is tolerably abundant in Greenland, being found on both coasts, and it extends from Hudson's Bay down to the coasts of Georgia and Carolina. In the Bay of Fundy Mr. Dresser found it common, and he remarks that further south in the States it penetrates as far inland as the Missouri.

Habits.—In the tropics, where the haunts of the Cormorant are mostly in wild country or on unfrequented shores, it is not such a well-known bird as in Great Britain, where its gaunt figure is in many parts quite a feature of the coast-scenery. It is essentially a sea-coast bird, living principally on salt-water fish, but nevertheless frequenting rivers and lakes which abound in fish in the vicinity of the sea, where, when its numbers are great, it creates most serious havoc among the finny tribes. In India and Ceylon it is to be found on jheels, lakes, swamps, and large rivers, as well as on estuaries, harbours, and the open coast. The most notable feature in the economy of this Cormorant is its extraordinary voracity and its remarkable digestive powers. It is a most expert diver, disappearing instantaneously beneath the surface without making any splash at all, and once under water pursues its prey with great speed, using its wings half extended and taking short quick strokes. In pursuing a wounded bird up the arm of a shallow brackish lagoon I have had a good opportunity

of seeing the Cormorant using its wings in this manner, by which it kept ahead of the boat, which was going as fast as one man could row it. It sallies out early in the morning, and commences to fish at once; and in the summer may be seen digesting its food, resorting to favourite and safe perches on isolated rocks, as early as seven o'clock. At this time, when gorged with fish to such an extent that locomotion is a somewhat arduous matter with it, it may be approached more nearly than at other times. It sits resting on its tail, which is always used for that purpose, with its head drawn in, and every now and then extends its neck suddenly, in order to force the fish further down its gullet. After having been at rest for some time, it stretches out its wings, and keeps them extended until they are dried. In the afternoon it commences to fish again, and before retiring for the night to its accustomed roosting-place makes a very heavy meal. One which I saw killed on the Welsh coast at sundown disgorged five rock-perch, two of them weighing half a pound, a fair-sized eel, and a young salmon. I have myself taken gurnet 8 inches long from their throats, and have known a Cormorant (which was shot in the act) at Craig y dorn to pursue a salmon of about 3 lbs. in weight. Some idea of the enormous quantity of fish which must be consumed by a large colony of these birds may be arrived at by taking their number at 100 pairs, and assuming at the very lowest that each bird takes 4 lbs. of fish in a day; this will give, as the prey of 200 birds, 800 lbs. in a day, or more than 122 tons in the year. Were it not for the wonderful digestive powers of this Cormorant, it could not dispose of such quantities of food; but so rapid is the process of digestion, that fish when only just passed into the upper part of the proventriculus, or the portion of the stomach just beneath the "crop," are found broken up into small pieces by the action of the gastric juice.

Besides acting as a prop for the bird when sitting upright on a rock or ledge of a cliff, the rigid tail of the Cormorant serves the purpose of a powerful lever in the water, enabling the bird to ascend or descend in deep water by a stroke upward or downward, as required. The Cormorant perches with its bill pointed upwards, and when watching the approach of its enemy, man, twists its neck from side to side, looking over its back in an awkward manner; on flying off from such a situation it proceeds easily, taking quick strong flaps; and soon the momentum of its heavy body carries it forward with great speed; its neck is carried stretched out as a rule, particularly when flying along the water or before alighting on a rock, but not unfrequently, when descending from an altitude to a fishing-ground, it draws back its head, like a Heron. From the water it rises with difficulty, flapping along for some distance before it can mount into the air. Normally it is quite a silent bird, but in the breeding-season has a variety of notes, which I will presently notice. Cormorants roost always in the same place, and may be shot by watching beneath the cliffs to which they fly at sundown, coming in from all directions, and keeping usually at a considerable height. The immature birds are to be found at these localities while the adults are away at their breeding-colonies. In former days these birds used to be kept in England for fishing-purposes; and an instance of a royal Cormorant-fancier is to be had in Charles I., who, Sir Thomas Browne tells us, was supplied from the tree breeding-place at Reedham, in Norfolk. In China they are still used by the inhabitants for fishing; a ring is placed round the neck to prevent the fish being swallowed; but when a sufficient quantity have been caught, the ring is removed and the bird allowed to fish for itself. Père David, who refers to these birds being so tamed in China, says that the Chinese breed them in captivity, hatching the eggs under hens. In countries where the Cormorant is not molested it becomes very tame. Przevalsky speaks of it as such in Mongolia. In most regions, however, it is a very shy bird, as it is so much persecuted on account of its poaching tendencies; indeed it is one of the few birds not included in England under that most praiseworthy enactment, the "Sea-fowl Preservation Act." In order to enable it to seize large fish the Cormorant is possessed of great strength of bill, and inflicts a serious injury if, when wounded, it contrives to seize the hand with its sharp mandibles; its assault is aggravated by its always shaking whatever it has hold of, just like a terrier shakes a rat. In this way I have known it pierce a man's hand to the bone. It is worthy of remark that in the autumn it is often infested with ticks, which fasten on its head and neck.

I conclude this notice of the habits of the Cormorant with an extract from Dr. Saxby's excellent account, in the 'Birds of Shetland,' of the behaviour of a tame example, and which I take from Mr. Dresser's work. After speaking of the extreme docility and remarkable amount of intelligence displayed by his pet, he proceeds to speak of his voracity, remarking that when "Ducks were fed he would rush boldly in among them and appropriate any thing in the shape of fish or flesh that happened to suit his fancy; but he never would eat

salted food. Sometimes, also, when he saw a boy coming to the house with fish he would waylay him, and, if no contributions were then offered, he would speedily settle the matter by helping himself. One day, when food was scarce and he had been fasting for many hours, I happened to pass by carrying a number of Starlings, one of which I tossed at him, but scarcely with the expectation that it would be accepted. However, he caught it cleverly before it could reach the ground, and the next instant it disappeared down his capacious throat. Another followed, and was treated in the same way; then more, until no less than five had been thus disposed of. This number seemed to satisfy him; and, the whole neck being enormously distended, it was with difficulty that he waddled away to his favourite corner of the coal-shed, where I left him sitting, face to the wall, upon a lump of coal, the legs of the last Starling still projecting from the corner of his mouth. After this a bird was always a favourite morsel, and he would follow me for a long distance when I happened to be carrying a gun. Once I gave him, for a single meal, two Buntings, a Twite, a Sparrow, two Snow-Buntings, and a Ringed Plover; and even then he followed me for more. Birds, fish, and mice were always swallowed head foremost. During the first two years he kept almost entirely to the ground, only occasionally sitting upon a stone or low wall; but afterwards the roof of the house was preferred, from which elevated position he used suddenly to pounce down, either to rob a fish-basket or to scatter a company of feeding Ducks. But this was merely as a diversion, not as a necessity; for from the time of his first taking up his position on the roof he also began regularly to procure his own meals, flying to the voe for that purpose, and after remaining there for an hour or two, returning to his former station by the chimney."

Nidification.—In India the Cormorant nests frequently in trees growing in inaccessible swamps and jheels; but in temperate climates generally resorts to high cliffs or rock-bound shores, where it is safe from the attacks made upon its eggs and young. Mr. Hume has been informed that it breeds on rocks in the river Jumna near Allahabad, and also on the Chumbul near Etawah. Mr. Oates, however, gives us an authentic account of a vast breeding-place in the great Myitkyo swamp in Burmah, where it nests in "low, apparently dead, trees which rear their heads 15 or 20 feet above the water." He was unable to reach the trees himself, and sent a native to procure the eggs. "At a short distance the nests," he remarks, "appeared to be made of twigs; but I have often seen these birds dive in the canal and fly off with weeds fully 5 feet long. These no doubt enter into the composition of the nest." The eggs were taken on the 4th of October; but he observed birds carrying sticks and weeds up to the 27th of that month. His specimens measured 2·3 to 2·6 inches in length and 1·5 to 1·7 in breadth.

In parts of Europe this bird breeds on trees; and an account of a very large colony, situated on an island in the Klossowski lake (North Posen), is given by Mr. Dresser from the letter of a correspondent, Dr. Kütter. Here about 400 pairs breed in lofty fir and oak trees in company with about 200 pairs of Herons. A description of a large breeding-place at the Samara-Dhund swamp in the Eastern Narra district, where the nests are all placed on trees only 4 or 5 feet above the water, is also given by Mr. Doig, C.E., in 'Stray Feathers,' 1878, p. 468. The nests were large platforms of sticks, the eggs being laid on a thin bedding of grass. In one nest there were as many as seven eggs. In Denmark, as has been already stated, it used to breed in the forests near the sea, and about a dozen localities are cited by Mr. Collin from which it has now been driven. Finally, there was, in former centuries, the breeding-place at Reedham above alluded to. Now it is known to breed only on sea-cliffs, on rocks and precipices, on the borders of lakes in Scotland, or on crags near the coast, as in Wales. The most celebrated breeding-place in the latter country is that known as Craig y deru (the "Bird-rock"), in Merionethshire, which, through the kindness of the owner of the estate, Major Stewart, of Shrewsbury, I was enabled this year to visit. The "Bird-rock" is one of the buttresses which flank the south side of a pretty valley running up from Towyn to the sides of Cader Idris, and is situated about seven miles from the sea. A walk of two miles and a half across the flat country near Towyn, past the gates of the fine old seat, Ynys Moengwyn, brings the pedestrian to the foot of the hill which divides the two valleys intersecting this part of the country; and after bearing to the left, the road leads along the slope of the dividing range, and the breeding-place of the Cormorants opens out. It is a bold crag of trappean rock with two faces, the western tumbling down to the fields below in lumpy masses and steep grass- and bracken-slopes, the northern a sheer precipice of 300 feet, supported by a grand slope of fallen rock and earth about 400 feet in height. A few Cormorants were seen wending their way in from seawards high above our heads, and now and then one

launched himself out from the dizzy height, and after circling over the field below returned to his perch beside his nest; but, further than this, we saw no signs of the colony till we rounded the corner formed by the two faces of the rock, when suddenly burst upon us the lofty precipice, with its pinnacles standing out from the main mass and its whitened ledges, on all of which sat rows of glossy Cormorants, writhing their long necks, while the clanking notes (*kliōi-ink, kliōi-ink*) of the young birds crying for food made the rock resound again. We had not long commenced to ascend the steep slope towards the foot of the crag when a pair of Peregrines darted out, one mounting far above the rock, and the other commencing her harsh note, *kra, kra, kra, kra*, which it kept up as it flew round and round for five hours incessantly. The eyrie was about 100 feet from the top of the crag, and directly above, on the very top of the rock, we found the spot strewn with the remains of young Cormorants, Jackdaws, small birds, &c., where the meals of the young Peregrines were prepared. Now and then a Cormorant, launching himself from the rock, would pass rather too near the nest, and the Falcon would swoop at him, making him emit a hollow bellowing sound like *kiōōng*. There were about 80 pairs of Cormorants nesting here, and at the time of my visit (5th of June) most of the young were hatched out; but some eggs obtained were almost fresh. The nests were situated mostly on slanting ledges of about 3 feet in width, or in nooks in the precipice; but many were on the very summit of detached pinnacles, from which, as the gamekeeper who accompanied us said, many nearly full-grown young fall and are killed. They stand round the edges of the nest for some time before they are taken down to the water by their parents, and probably in fighting with one another get pushed off the pinnacles. The nests were nearly all constructed of stems of the bracken-fern, plucked from the hill above the crag; they measured about a foot in internal diameter; and the young, which were mostly three in number, sat with their heads pointing in the same direction. When returning from the sea to their young, or when coming back to their nests after being fired at, we always knew when the birds intended to alight by their spreading out their tails and stretching out their legs and huge feet almost at right angles to their bodies for about 50 yards from the nest, on arriving at which they uttered a loud guttural *glock, glock, glock*, which was answered by the other bird, were she on the nest, by a somewhat different note, like *goik, goik, goik*. My companion, an intelligent bird-stuffer and "naturalist" of Aberystwith and a crack shot, had brought with him a powerful 10-bore gun so as to procure specimens; on a bird being fired at numbers of its companions would launch out into the air, but after flying round for a few minutes would come back a dozen at a time with a booming sound, like the rushing of the wind in a vessel's rigging. Others sat still and did not move, and while some of the nests were being robbed many sat complacently watching us only a few yards distant. I was struck with the extraordinary vitality of some of the birds, which, when picked up, were found to have been shot right through: they flew steadily out from the top of the rock, many hundreds of feet above the fields below; and as we watched them, looking towards the beautiful woods of Peniarth-achaf, the seat of Major Stewart, we observed them begin to quiver now and then, the motion of the wings becoming slower; then a sudden dip, followed by a few spasmodic flaps, told us that all was over; the birds would commence to descend rapidly, and spinning round and round through 800 feet of space, fell to the ground with a thud that we could hear from our elevated position. The young when taken from the nests stretched out their necks constantly and expanded the muscles of the pouch, at the same time quivering their heads. They are fed with digested food when quite young. The eggs we took are long, nearly perfect ovals, slightly pointed at one end, and are covered with a moderately smooth chalky coat of varying thickness, which in many places comes away in large patches (most probably scraped off by the bird's feet when newly laid) and discloses the bright sea-green under-shell. Examples measure 2.43 by 1.52 inches, 2.62 by 1.61, 2.43 by 1.6, 2.54 by 1.57, 2.65 by 1.61, and 2.68 by 1.63.

The young are conveyed down to the water on the backs of their parents, which interesting performance may, I am told, frequently be witnessed at the Craig-y-dern rock.

Since this article went to press, my friend Mr. Secbohm informs me that he visited an extraordinary breeding-place of the Cormorant, between Amsterdam and Utrecht, this summer, where a large colony were breeding *on the ground* close to a sheet of water; there were about 200 nests in a space of about 15 square yards; they were piles of sticks from one to four feet high, looking as if a new nest was made every year.

PHALACROCORAX PYGMÆUS.

(THE LITTLE CORMORANT.)

Pelecanus pygmæus, Pallas, Itin. ii. App. p. 712 (1773).

Carbo javanicus, Horsf. Trans. Linn. Soc. xiii. p. 197 (1821).

Graculus pygmæus (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 298 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 272; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1491 (1873); Legge, Ibis, 1874, p. 27, et 1875, p. 409.

Graculus javanicus (Horsf.), Jerdon, B. of Ind. iii. p. 863 (1864); Holdsw. P. Z. S. 1872, p. 483.

Graculus melanognathus (Brandt), Hume, Nests and Eggs, iii. p. 660 (1875).

Phalacrocorax pygmæus (Pall.), Dresser, B. of Eur. pts. 51, 52 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 496, et 1879, p. 116 (List B. of Ind.).

See krai, Dutch in Ceylon; *Graya de Mare*, Portuguese in Ceylon; *Pankowa*, Hind.; *Nirukaki*, Telugu; *Pechuck*, Java (Horsf.); *Fesichah*, Arabic; *Kadal Cagam*, Tamil, lit. "Sea-Crow" (Layard), also *Nir kakum*.

Diya kawa, Sinhalese.

Adult male and female. (Ceylon) Length 20·0 to 21·0 inches; wing 7·2 to 7·75; tail 5·0 to 6·0; tarsus 1·2 to 1·3; outer toe 2·2, claw (straight) 0·28; hind toe 0·9; bill to gape (straight) 2·1 to 2·2. India (B. Mus.) Wing 7·8 to 8·1; tail 5·7 to 6·5; tarsus 1·29; outer toe and claw 2·3; bill to gape (straight) 2·2.

This species has 12 tail-feathers.

Iris greenish brown, varying to greenish white; bill fleshy, upper mandible dark brown; facial and gular skin dark.

Breeding-plumage? (Algiers: B. Mus.). Forehead, lores round the eye, gape, and chin black; head, back and sides of neck, and upper part of throat light earth-brown, darker on the ear-coverts; rest of plumage deep black, glossed with green; scapulars, wing-coverts, tertials, and outer webs of secondaries grey, the margins of the feathers and the shafts black; tail greyish black; on the under surface and flanks, neck, and back are numerous fine white plumelets, consisting of a fine shaft and white triangular webbed tip; these overlay, as it were, the plumage, and are quite independent of it; there are fine plumelets also on the wing-coverts.

The dimensions of this example are—wing 8·0 inches, tail 6·0, bill to gape 2·0, outer toe 2·3, tarsus 1·2. The shafts of the clothing-feathers are stiff, giving the plumage a spinous character. I have never met with a specimen in Ceylon in this dress; at the same time, I must admit, I did not shoot any *prior* to the breeding-season, when this plumage, if it is characteristic of breeding, would have been worn.

There is a specimen in the British Museum from India, which is glossy black, with the feathers spinous, as in the above; the throat is whitish, changing by a moult into black, and some tiny white plumelets are appearing on the back, so that the bird appears to be passing into the striated stage. Whether this plumage is changed *during* the nesting-time, or whether this species breeds sometimes in a different livery, showing signs of immaturity, I do not know; but the following is a description of a specimen shot at Uduwila at the nest:—Above black, glossed with green on the back, and slightly inclining to brown on the head and upper part of hind neck; the feathers of the head margined with earthy brown; lores whitish; a small whitish patch over the ears, a white streak at the gape; chin white; feathers of the shoulders and interscapular region edged like the head; the scapulars and wing-coverts tinged with silvery grey with a black border, and the extreme margin earthy grey; quills tipped with the same; the outer webs of the secondaries tinged with silvery grey; under surface brownish black, the feathers indistinctly paling into earthy brown on the chest and fore neck; under tail-coverts and under wing greenish black.

This bird is probably immature; but this may be, notwithstanding, the normal non-breeding plumage of the species put on while at the nest.

Nestling in down. Iris grey; bill blackish, the skin of the forehead and the tip of the lower mandible whitish, covered with blackish down. The clothing-feathers, when they appear, are blackish brown.

Immature in first year. Iris hazel-brown, with a white outer circle; upper mandible and pouch brown; the lower mandible and the margin of the upper from the gape to the tip whitish; legs and feet black.

Chin and gorge whitish for nearly 1 inch from the base of the bill; head and neck pale earthy brown, the centres of the feathers being blackish brown and the margins ochreous grey; feathers blackish on the forehead; shoulders and interscapular region black-brown, conspicuously margined with fulvous grey; scapulars, wing-coverts, and secondaries pervaded with dull silvery grey, with a dark pale-margined border; back and rump black, the feathers indistinctly pale-tipped on the rump; tail tipped with earthy brown; neck and chest ochreous brown, tipped with fulvous grey, passing on the flanks and abdomen into greyish.

Distribution.—This species is very abundant in Ceylon, and is widely distributed, for though it is chiefly confined to the tank-districts in the northern, eastern, and south-eastern parts of the island, it is also found in brackish waters in the western province and southern provinces. In the latter region it is often met with in the non-breeding season on the Amblangoda, Bolgodde, and other lakes, and even visits the Kotte lake occasionally. It is plentiful in the Kurunegala district, breeding at Nikaweratiya tank, where it is, as at many other extensive sheets of water further north, a permanent resident. In July I met with enormous numbers at Minery Lake, and have seen large flocks on Kanthelai tank at the same time of the year. It is plentiful at Rugam, Devilane, Ambaré, and Irrukkamam tanks, and in the Hambantota district affects Tissa Maha Rama and other extensive waters. Except when on passage up the eastern coast to its breeding-haunts, I have never seen it affecting the sea-shore like the larger Cormorant.

In India it is very abundant, frequenting inland waters all over the country. In the Deccan Messrs. Davidson and Wenden say that it is very common, and Dr. Fairbank noticed it along rivers there. Mr. Ball records it from Lohardugga, Singhbhum, Sambulpur, Orissa, Nowagarh, and Karial, and elsewhere remarks that it is very common all over Chota Nagpur. It is also found in the adjoining state of Raipur. Mr. Hume informs us that it sold abundantly in the Calcutta bazaar as "Black Duck!" so that it must be plentiful in the neighbourhood. In Furreedpore and in Cachar it is likewise very common, extending eastwards into Arrakan, Upper Pegu, and Burmah, and breeding in "incredible numbers," according to Mr. Oates, at the Myitkyo swamp in the latter country. In Tenasserim it is plentiful throughout the province; and although it is not yet recorded from the Malay peninsula, it no doubt inhabits that region, as it is found further south in certain islands of the archipelago, among which Java may be cited, where Horsfield procured it and described it as *Carbo javanicus*. I do not find it recorded from the Philippines, nor is it included in either Mr. David's or Mr. Swinhoe's Chinese avifauna; so that it does not appear to have an easterly range beyond Burmah. It likewise is omitted from Przevalsky's Mongolian birds.

Returning to India, it does not appear to occur in Nepal, but ranges westward as an inhabitant of the low lands to Rajpootana, Sindh, and the surrounding regions. It is uncommon at the Salt Lake at Sambhur; but in Sindh Mr. Hume met with it in the interior in vast flocks; and I find Captain Butler speaking of it as not uncommon in Guzerat, though it rarely occurs at Mt. Aboo. Passing north, Severtzoff speaks of it as breeding rarely in the north-west of Turkestan; but it does not appear to range into the uplands of Kashgharia. It extends through Persia into Palestine, where Canon Tristram observed it on the Leontes and other streams flowing into the Mediterranean. It has been met with not uncommonly in Asia Minor; and, as regards Turkey, is said by Messrs. Elwes and Buckley to be common in Macedonia, being also found on the Danube, where it breeds in large colonies in the willow- and poplar-covered islands. It ranges eastwards to Dalmatia, occurring also in Italy, and rarely visiting Sardinia. It has not been observed in Spain; and, in fact, belongs only as a resident to South-eastern Europe, ranging into Hungary, Transylvania (where it appears in large flocks), and Southern Russia, as far north as the Caspian. It is more common in Germany than in Italy, but does not extend as far north as the Baltic. Lord Lilford writes that it is very abundant in winter in the Epirus.

On the continent of Africa it occurs in Egypt in the Fayoom, where Captain Shelley found it not uncommon on the great lake of Birket el Korn. Von Heuglin also states that it is common as a winter visitor on the lagoons of Lower Egypt; but he never encountered it on the Nile.

Habits.—The Little Cormorant, as will have been noticed in my outline of its distribution, is almost exclusively an inhabitant of fresh water, whereas its larger relative, as we have observed, levies heavy contributions alike on the finny tribes of both salt and fresh water. The present species is not, according to my experience, a very shy bird; for when sunning itself with outstretched wings on rocks or partially submerged fallen trees, I have often approached within shot of it, and might have procured many specimens had I been able to retrieve them from the crocodile-infested waters. This species affects open sheets of water, and also smaller tanks which are only overgrown at the edges, fishing singly or in small parties; it flies swiftly, and when going off to its roosting-places at dusk it proceeds in a long wavy line, which is led from the flocks on the water, the birds rising one by one as soon as they see that a movement has been commenced by their companions. When fired at they often dive, but sometimes get on the wing and circle round the tank, alighting in a place of safety. Like the Large Cormorant, they flap along the surface of the water when first rising, proceeding some little distance before they are able to mount into the air. The Little Cormorant is very destructive in its way to fish; but is obliged to confine itself to small fry, although it occasionally disposes of good-sized prey; it feeds largely on shrimps. In the month of November I observed, on two occasions, large flocks of this bird coming from the direction of Foul Point towards the Fort. On arriving in Dutch Bay they alighted in a mass, and crowded so close together, that at least fifty birds occupied no more than about three square yards. After remaining some little time diving and swimming quickly about, they took wing for the north, going, as I afterwards found, to the Kodyam kulam and other tanks to breed. It is, like its congeners, a silent bird; but when nesting makes a craking note.

Nidification.—The breeding-time of this Cormorant is the same as that of the Herons and Egrets, in whose company it nests. In March I found the young nearly all hatched; and in the Hambantota district, and near Trincomalie, most birds had eggs at the time of a visit I made to a large breeding-place in January. Large numbers nest together, building fifteen to twenty nests sometimes in one tree; at Uduwila I found the Darter and the Glossy Ibis nesting in the same trees, and at Kodyam kulam, near Trincomalie, the Little Egret. The nests were placed mostly on the outer lateral branches, and were small platforms of sticks resting on horizontal forks; the egg-cavity, which is very slight, is lined with fine twigs, and the eggs varied from two to four in number. The exterior surface is chalky white, smooth in places, rather rough in others; beneath the outer coating the shell is pale greenish blue. They are nearly uniform ovals in shape, some more compressed at the small end than others; several specimens measure 1.81 by 1.08, 1.83 by 1.19, 1.75 by 1.17, and 1.85 by 1.06 inch, the latter specimen being a peculiarly long and narrow egg. The old birds I found very tame, alighting on trees close to those containing their nests, and twisting their necks awkwardly from side to side, to see what was going to happen to their charge. The young, when partly fledged, perched in small branches adjacent to their nests, and huddled together, three or four in a row.

In India they nest, says Mr. Hume, in companies of from five or six to fifty or more pairs, and often take possession of nests built by Crows or "Paddy-birds." His measurements of the eggs are—length 1.65 to 1.92, breadth 1.08 to 1.25 inch.

Genus PLOTUS.

Bill slender, straight, very acute at the tip; the commissure slightly recurved; gonys pronounced and ascending; nostrils very minute, basal and linear. Wings pointed, the 3rd quill the longest, the 1st shorter than the 4th. Tail long, of 12 rigid feathers, the webs corrugated. Tarsus shorter than in *Phalacrocorax*.

Neck very slender, with a bend in the vertebræ, similar to that of the Heron. Scapulars elongated.

PLOTUS MELANOGASTER.

(THE DARTER.)

Anhinga melanogaster, Forst. Ind. Zool. p. 22, pl. 12 (1781).

Plotus melanogaster, Gm. ed. Syst. Nat. i. p. 580 (1788); Sykes, Cat., P. Z. S. 1832, p. 171; Jerdon, Cat., Madr. Journ. 1840, xii. p. 222; Blyth, Cat. B. Mus. A. S. B. p. 299 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 365 (1864); Holdsw. P. Z. S. 1872, p. 483; Salvadori, Uccelli di Born. p. 367 (1874); Legge, Ibis, 1875, p. 409; Hume, Nests and Eggs, iii. p. 661 (1875); id. Str. Feath. 1878 (B. of Tenass.), p. 496, et 1879 (List B. of Ind.), p. 116.

Der schwarzbäuchige Anhinga, Forster; *Black-bellied Darter*, Lath.; *Snake-bird*, *Silver-laced Snake-bird*, popularly in India. *Banwa*, Hind.; *Goyar* in Bengal; *Kallaki-pitta*, Telugu; *Dandang Ayer*, Sumatra; *Pambutara*, Ceylonese Tamils.

Diya kawa, *Belli kawa*, Sinhalese.

Adult male and female (Ceylon). Length 36.0 to 36.5 inches; wing 13.0 to 13.6; tail 10.25 to 10.5; tarsus 1.3 to 1.5; outer toe 2.8; inner toe 1.7; hind toe 1.0; bill to gape 3.85 to 3.92, at front 3.2.—*Male* (Sambhur Lake). Length 37.1 inches; wing 14.1, expanse 47.2; tail 10.5; tarsus 1.7; bill at front 3.9 (*Adam*).

Iris pearly white, with an inner and outer ring of yellow; bill with the upper mandible brownish olive, paling into horny grey at the tip; under mandible yellow, changing into greenish grey at the base; legs and toes bluish; inside of tarsus and webs yellowish; toes dusky at the tips.

Adult male. Head and hind neck blackish brown, each feather with a distinct pale buff margin, increasing in width at the sides of the lower part of the hind neck; interscapular region, back, and upper tail-coverts glossy green-black; shoulders, just above the scapulars, with white spots, which lengthen out on the long lanceolate upper scapular-feathers into silvery white streaks, the shafts being, however, black; the lower scapulars are broad, with the stripe on one side only of the shaft; wings and tail green-black, the wing-coverts with broad, pointed, white centres, lengthening on the greater series into very broad stripes; the outer webs of the tail-feathers, as also those of the broader scapulars, singularly corrugated; points of the wing white; a fine white line from the forehead bordering the loreal skin and extending to the eye; face, throat, and upper part of fore neck white, passing in a stripe from the face down the sides of the neck for about 6 inches; centre of the fore neck paler than the sides, the centre of the feathers being brownish, but the margins broader and whiter than on the latter; on the upper part these feathers gradually blend into the white of the throat, and on the lower become whitish, forming a pale central streak; entire under surface, flanks, and sides of the neck just above the chest intense black, extending up the fore neck in a point; under wing black.

Adult female (Trincomalie, January). Very similar to the male, but with the pale margins of the head- and neck-

feathers more fulvous, and at the sides of the hind neck there is a broad tawny yellow border next the black of the chest, extending up to the pale stripe on the centre of the fore neck; the stripes of the scapulars, those of the wing-coverts, and the spots of the shoulders are pale golden instead of white.

Young. The nestling is covered with white down, and the first plumage is acquired as follows, my observations being based upon a pair which I took from the nest and reared:—The black scapular feathers, quills, and tail-feathers are acquired first; the quills grow rapidly, then the greater wing-coverts, which are silvery whitish; blackish down-like feathers then appear on the rump and on the shoulders, and then a line of dark feathers down the centre of the breast, which gradually extend to the flanks (during this time the head and neck remain in the white down); shortly afterwards feathers with fulvous edgings appear at the sides of the shoulders and at the point of the wing; then the hind neck commences to clothe from the shoulders upwards, and then the forehead and front of the crown, which are bare and bluish green, commence to clothe with white down. The under surface becomes quickly feathered, eight or nine days only elapsing from the time the black stripe appears until the entire breast and belly are clothed in black feathers with fulvous tips. The iris at this stage is greyish olive and the bill dusky fleshy; legs and feet bluish. The time taken for the whole body to become feathered was from the 12th of February to the 10th of March, at which latter date, however, the neck was still in white down, giving the bird a handsome appearance.

In the first year. Iris yellowish grey; bill brownish green; tarsus and toes exteriorly brown, interiorly yellowish.

A male before me has the crown and down the centre of the hind neck blackish brown, the sides of the neck dark tawny, paling in front, the centres of the feathers dark; chin and throat whitish, the feathers extending in a line along the lower part of the loreal skin, which in the adult is entirely bare; face tawny, with an indication of the whitish stripe; under surface and lower part of the fore neck black, with pale tips to the feathers, the tawny yellow bordering next to the shoulders broad and blending into the blackish of the back of the neck; the upper scapulars are short but narrow, and have the white stripes, as have also the wing-coverts; the margins of both are, however, fulvous; the corrugations of the tail and scapulars are almost obsolete.

The full plumage is not acquired until after the second moult.

Obs. The Australian Darter (*P. novæ-hollandiæ*, Gould) is allied to the present species. The lower part of the throat is rufous, and there is an arrow-shaped white gorget, beneath which the neck is brown, the stripe on the side being much broader than in the Indian bird. The light colour of the neck is divided off from the black under surface by a pale border in the same way. A specimen in the British Museum measures as follows—wing 13.5 inches, tail 9.5, tarsus 1.65. In Africa is a third species, *P. levaillanti*, Temm., of similar size to the two already noticed—wing 12.1 to 13.18 (*Heuglin*), 13.5 (*Layard*). It has the sides of the neck striped with black; scapulars striped with fulvous. A fourth species is the American Darter (*P. anhinga*, Linn.), specimens of which were brought to the Zoological Gardens in London some years ago.

Distribution.—The Darter is a common bird in the hot jungle-clad districts of the island, frequenting the vicinity of tanks from the extreme north down to the neighbourhood of Kurunegala on the west, and round the east coast as far as Hambantota and the Girawa Pattuwa. I have met with it at all large tanks and many small village ones throughout the northern forests, and found it breeding in the neighbourhood of Trincomalee not far from the sea. It inhabits the Bintenne Lake, and perhaps other sheets of water near the base of the hills. It is common in the Hambantota district; but I do not know that it extends westwards much beyond Tangalla, except as a straggler, for there, as also in the Western Province, where I have never seen it, the country is unsuited to its habits. It has, however, been occasionally procured at Kotte lake. It reappears north of the Maha-oja, and breeds at the Nikaveratiya tank. Mr. Holdsworth met with it at Aripu, and I believe it is found at the head of the Jaffna lagoon.

It is found throughout India, being, according to Jerdon, exceedingly numerous in some parts of the country, especially in Bengal, where hundreds are often to be seen on a single jheel. As regards its presence at tanks in the Carnatic, I find no special mention; but in the Deccan Messrs. Davidson and Wenden say that it is sparingly distributed. It is found throughout Chota Nagpur, from all districts of which Mr. Ball records it, as also from the eastern parts of the Central Provinces southwards to the Godaveri river. Turning westwards I find Mr. Hume noting it as occurring on the inland lakes of Sindh; and Mr. Doig records it as breeding on the Eastern Narra. It is common in Guzerat, Cutch, and Kattiawar, and in February Mr. Hume

met with it in numbers on the Kunkrowlee lake in Oodeypore. At the Sambhur Lake it has once been shot by Mr. Adam. From the plain-country of Bengal it extends into the valley of Nepal, where Dr. Scully found it fairly common on a lake near Bichiakoh in December. In Furreedpore Mr. Cripps says it is common. Further east, in Upper Pegu, Mr. Oates testifies to the same fact, and at the Myitkyo swamp in Burmah he found it so numerous that he observed two hundred nests in one locality; in Tenasserim it is plentiful both inland and near the coasts. In the Malay peninsula it doubtless occurs, though I find no record as yet of its having been procured there. In the archipelago it has been found in Sumatra, Java, Borneo, and Celebes, from which islands it is recorded by Salvadori in his 'Uccelli di Borneo.' Recently also I observe that Herr Meyer procured it on the river Tumupat near Manado. Whether it extends to the island of New Guinea or not I am unable to say; but on the south coast the Australian species is found, and may perhaps replace our bird entirely in Papua. From Borneo it finds its way by the Sooloo archipelago to the Philippine group, where it has been obtained in the islands of Mindanao and Negros.

Habits.—This handsome Diver entirely resembles its near relatives the Cormorants in its economy, being entirely a fish-feeder. It is, however, a more expert diver, its slender form and long, snake-like neck being entirely adapted for rapid entry into and progress under the water. From its position on a stake or log near the surface it disappears like an arrow beneath the water; and when swimming is equally expert, for, if alarmed, it sinks its body, and nothing is seen but its long neck, and sometimes only the head, which it darts down out of sight as quick as thought, leaving scarcely a ripple on the surface. I know of no quicker diver, not even the Grebe, than this bird. In Ceylon, as also, from published accounts, in India, the Darter frequents wild unfrequented tanks and jheels, preferring smaller and partly overgrown sheets of water to the larger lakes, like Kanthelai and Minery; but nevertheless in these localities a good many may be seen during the non-breeding time. It is very shy and wary, usually perching on submerged logs and trees well out of shot; here it sits with extended wings and outstretched neck, twisting its snake-like head from side to side to assist its visual powers on the approach of danger, and rarely allows the sportsman to approach within range. It is very swift on the wing, flying with rapid regular strokes, and has a habit in the breeding-season of mounting to a vast height in the air until it looks like a mere speck against the blue sky. It sometimes soars, making one or two circlings with outstretched pinions, and then continuing its course with slow beats.

The neck and gape are capable of great expansion, and it is surprising what large morsels one of these Darters can dispose of. The angular bend in this bird's neck, formed by an alteration in the direction of two or three of the cervical vertebrae, which are set at right angles to those above and below, is the normal position; for the neck is always held thus both sitting and flying, and is never stretched out, except when diving, or when, in confinement, the bird is eager to receive its food. The use of this bend is to impart a powerful leverage in "chucking" the head when jerking its food down the throat, for the bend or short arm gives power to the longer, at the end of which is the bird's head. This is apparent if the lower portion of the neck be grasped in the hand while the bird is chucking its head forward. A pair which I kept in confinement when quite young stretched up their necks to be fed with a tremulous motion of their heads and a combined expansive movement of their pouches, their mouths being held wide open; at the same time they gave vent to a tremulous cackling note mingled with a *chick, chick* sound; now and then, when walking about, they uttered a whistle like *qrē-āk*. After a while the youngest died, and the other became very tame, wandering about the outhouses, and often taking up its quarters in the kitchen, where it knew there was food to be had. It was most voracious, attempting to swallow every thing that came in its way, and one day succeeded in bolting a good-sized beef-rib, which would have killed it had I not observed the occurrence and made it disgorge the bone by seizing the lower part of the neck. Before it had acquired its feathers it used to perch upon the edge of its box and extend its pinions, after the manner of its species; the older it became the more it practised this habit, more particularly in the mornings, and at the same time (after it had acquired its plumage) erected the whole of the back-feathers at right angles to its body, raising the wing-covert feathers to an angle of about 70°; the lesser series, however, were held almost as erect as the back-feathers.

The note of the adult is a harsh disyllabic crake, very like the sound emitted by the young.

Nidification.—I found this bird breeding at Uduwila tank in March 1872; and in April of the following

year the Government Agent of the district, Mr. Thomas Steele, C.C.S., kindly sent a man to the same spot to procure eggs for me. He found the entire colony of nests built by the Herons, Ibises, Pelicans, &c. removed, the tank being tenanted solely by a few Darters, who were breeding. In February 1875, at a colony of Egrets, Herons, and Cormorants in the north, I discovered about a dozen pairs of Darters breeding. Their nests, as at Uduwila, were apart from the rest, being placed in trees which grew in the most inaccessible part of the tank. They were built on the tops of the trees, and were rather scanty platforms of small sticks lined with roots. In size the nests were not much larger than those of the Small Cormorant, and not more than three were in the same tree. The females sat closely, with the head drawn in, and did not leave their nests till I had waded close up to the trees; they then flew to the tops of adjacent trees, and returned as soon as I quitted the spot. I observed that, when perched, they frequently scratched their heads, lowering them to a horizontal position, and sometimes below the level of the body; the claws were applied and rapidly moved, as in the case of an ordinary perching-bird. The number of eggs was usually three in a nest; but in some there were four. They are normally elongated ovals, slightly smaller at one end than the other; but they vary in shape, some being much broader than others. The external texture is rough and chalky; but beneath this exterior, which is dull white, and which is easily removed and is often partially worn off by the bird's feet, is a smooth light green shell. They vary from 2.0 to 2.15 inches in length, and from 1.2 to 1.38 in breadth.

Mr. Hume's measurements of the eggs are—length 1.95 to 2.29 inches, breadth 1.28 to 1.46. In India, where the bird is, in some localities, very abundant, it breeds in large colonies. Mr. Oates speaks of one in which there were about two hundred nests.

Genus PELECANUS.

Bill immensely long, flattened, the tip furnished with a powerful nail; culmen flat, bounded on each side by a narrow groove, at the base of which the minute nostrils are situated; under mandible divided by a membrane or pouch, which extends to the tip, the base much broader than that of the upper, which is compressed beneath the nostrils. Wings ample and very long, the ulna being much lengthened; 3rd and 4th quills the longest; tertials exceeding the primaries. Tail of 16 feathers, rounded at the tip. Tarsus short, much compressed, reticulate in front; tibia almost completely feathered. Toes long, the outer slightly less than the inner; all four joined by a full web.

Of large size. Sternum with only a slight emargination in the posterior edge, the furcula completely joined to the keel.

PELECANUS PHILIPPINENSIS.

(THE GREY PELICAN.)

Pelecanus philippinensis, Gm. Syst. Nat. i. p. 571 (1878); Walden, Trans. Zool. Soc. 1875, ix. p. 246.

Pelecanus philippensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 297 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 858 (1864); Holdsw. P. Z. S. 1872, p. 482; Hume, Nests and Eggs, iii. p. 658 (1875); David & Oust. Ois. de la Chine, p. 531 (1877); Hume, Str. Feath. 1878, p. 495 (B. of Tenass.); Oates, ibid. 1878, vii. p. 41; Hume, ibid. 1879, p. 116 (List B. of Ind.).

Pelecanus rufescens (Gm.), Elliot, P. Z. S. 1869, p. 583 (in part).

Pélican des Philippines, Buff. Pl. Enl. 965; *Pelican*, Europeans in Ceylon. *Won-bo*, Arrakan (Blyth); *Walang kadda*, Java; *Koolookedai*, Ceylonese Tamils (Layard).

Kula-kidar, Sinhalese.

Adult female (March, Ceylon). Length 52.0 inches; wing 20.5; tail 8.5; tarsus 3.0; middle toe and claw 4.6; outer toe and claw 4.2; bill at front (not including the nail) 11.0, gape to tip of nail (straight) 12.3, width of upper mandible at the base 1.2, of lower at gape 2.2.

Feathers of forehead forming a concave line at the base of the bill.

Iris brown; bill fleshy, with bluish spots and oblique bars on either side of the culmen; pouch and facial skin fleshy, marked with dark veins and patches; legs and feet bluish; webs darker than the toes.

Feathers of the head and neck white with dark bases, of a fluffy character, and standing erect from the skin: a short nuchal crest an inch long and slightly recurved; interscapular region, upper scapulars, wing-coverts, and under surface white; the wing-coverts lanceolate in shape, and the longer scapulars and greater coverts with black shafts; the back, flanks, and axillaries delicate vinaceous, the shafts darker than the webs on the back; abdominal region and under tail-coverts tinged with vinaceous; underlying broad scapulars, tertials, greater secondary wing-coverts, secondaries, and tail grey-brown, the feathers white at the base, those of the tail paling to whitish at the margins; primaries and their coverts dark brown, white at the base; upper tail-coverts white, with dark shafts; under wing white, the lesser series of feathers rosy grey or vinaceous; under tertial coverts white.

This specimen was shot from the nest, and is much soiled on the under surface; the fluffy feathers end on the fore neck about 5 inches from the pouch, up to which point the normal smooth feathers of the under surface reach.

The rosy tint is, I imagine, variable, being much more conspicuous in some specimens than in others, and in the non-breeding season is absent.

Young. The nestling is at first covered with white down.

In first plumage the upper back and under surface, as also the neck, are brownish grey; lower back and upper tail-coverts whitish; wing-coverts brown; quills and tail dark brown.

Bill fleshy, the spots less plainly indicated than in the adult; legs and feet bluish.

Obs. The Grey Pelican of India, to which Gmelin's name appears applicable, has been considered by some to be the same as the African species, *P. rufescens*, Gm. Among those who have united the two birds are Schlegel, Elliot, and G. R. Gray; while other high authorities, Mr. Selater, the Marquis of Tweeddale, and Mr. Hume, hold that the Indian bird is distinct. I have examined the specimens of the latter bird in the British Museum and find that the feathers of the head and neck are quite different, not partaking of that fluffy or furry nature which is eminently characteristic of our bird; the crest is altogether different, and the bill has none of the peculiar "impressed" spots, which are also a well-marked feature of *P. philippinensis*; it (the African species) is also larger and has a longer bill than our bird. An adult specimen measures—wing 22.0 inches, bill (gape to base of nail) 12.2; an immature example—wing 20.5, bill (gape to base of nail) 11.3. There appears, therefore, to be no question as to the distinctness of the two species. Assuming that the Philippine bird is the same as the Indian, this species was first described from Luzon from an example sent to Paris.

Pelecanus javanicus, Horsf., the Lesser White Pelican of India, is white tinged with rosy; the tail is white also, and the primaries dusky grey. It is considerably larger than the Grey Pelican. Fifteen specimens tabulated by Mr. Hume measure in the wing from 23.0 to 26.75 inches; tarsus 4.25 to 5.5.

Distribution.—This Pelican is found throughout the northern half of Ceylon both on brackish lagoons near the coast and large tanks situated in the interior; its habitat extends down the east side of the island to the Hambantota district; but westward of Tangalla I never saw it, not even on any of the large salt lakes such as Amblangoda, Bolgodde, Pantura, and Negombo. It is not met with on village tanks; and though immense flocks may occasionally be seen on the larger sheets of water (Kanthelai, Minery, Padawiya, Rugam, Ambaré, Tissa Maha Rama, &c.), yet the Pelican is much more frequently seen on those estuaries, lagoons, and leways where the water is shallow and an abundance of fish is available for its sustenance.

In India it is the most abundant species of Pelican, according to Jerdon; but though it is so numerous and so widely spread it apparently retires principally eastward of Bengal to breed. Jerdon speaks of one Pelicanry in the Carnatic which he visited, and mentions the existence of many others. Mr. Hume, however, making more recent investigations, was unable to find the localities where any of these colonies existed, and is of opinion that Pelicans do not breed, as a rule, in the Peninsula. It must not be forgotten here that these birds, as well as other species (Hérons, Ibises, &c.) which congregate together, occasionally remove the entire collection of nests to other parts so completely that not a vestige of them exists in the following season. In the Deccan the Grey Pelican is evidently rare; Mr. Davidson mentions the occurrence of a single specimen at Pundharpur in September. From Chota Nagpur it is not recorded at all, and in the north-western region (Sindh, Guzerat, Cutch, Kattiawar, and Rajpootana) it is only a cold-weather visitant, though notwithstanding very numerous in certain localities, where it is met with in enormous flocks. In Rajpootana, however, it is only a straggler. In Eastern Bengal it does not appear to be very numerous. I observe that Mr. Cripps only observed it in the month of April in Furreedpore; in other portions of the province, however, it probably musters in greater force, for Blyth in 1849 stated it to be commoner in Lower Bengal than *P. javanicus*. In Pegu it was observed at Thayetmyo by Captain Feilden; and in the Shwaygheen district it breeds in enormous numbers, as will be presently noticed. In the northern parts of Tenasserim it is numerous in the breeding-season, especially in the neighbourhood of Thatone and Khyketo. In the Malay peninsula it is recorded from Malacca by Salvadori; and as an inhabitant of Borneo it is doubtfully noted by Salvadori. In the island of Java it has also been noticed; but I see no mention of its occurrence in Sumatra. It has been obtained in the Philippines at Luzon, and is doubtless found in other islands of the group. Returning to the mainland I find Swinhoe recording it from Amoy, and Père David stating that it is very common on the great rivers of the empire, as well as on the coasts. He observed it at Peking, and likewise met with it in the interior in Mongolia. It also occurs in Cochin China.

Habits.—As above remarked, the favourite haunts of the Pelican in Ceylon are the brackish salt lagoons and “leways” lining the eastern coast of the island. Here they meet with an abundance of food, and levy tremendous contributions on the finny tribes! It is their practice to form a line across a shallow piece of water, each bird a few feet apart from its neighbour, and then advance with their heads under water, seizing their prey right and left until the opposite side is reached and the whole lagoon is almost cleared of fish. It passes most of its time in the water, seldom approaching the banks, except to plume itself, and this it does mostly while floating lazily about. When thus situated it has rather a graceful appearance, its neck is curved backwards and its long bill carried down almost resting on the front of the neck; and when two or three are together they generally swim in single file or one a little behind the others in “échelon.” The Pelican rises with considerable exertion, flapping along the surface of the water and mounting gradually in the air until it has reached some height, when it proceeds along with very slow flaps of its immense wings, the head and neck drawn in, and, if there be a small flock, the whole proceeding in a line, one bird, as a leader, somewhat in advance of the rest. Long before they alight, having gained great momentum from their heavy weight and powerful wings, they descend with outstretched and motionless wings, literally sailing down to the water, when they drop their legs, and, carried forward by the impetus of their descent, plough up the surface for several yards.

An enormous “mob” of Pelicans suddenly alarmed and put on the wing presents the finest spectacle that can be witnessed of bird-life. There is nothing to equal it in the world. I have seen very large flocks of the splendid Australian Pelican (*P. conspicillatus*), but never saw any thing to equal the vast assembly that I encountered one morning in July 1875 on Kanthelai tank. The weather had been very dry, and the whole of

the Pelicans in that part of Ceylon seemed to have collected literally in thousands on the tank. My companion took a long shot into the "mob" with a rifle, and the various scattered flocks which were floating calmly about streamed steadily up into the air one after the other, and each commenced to soar majestically round in bold circles which crossed each other, overlapped, sometimes joined in one common circuit, and then rolled off again into separate parties until the whole air was a mass of immense circling birds which rose far into the sky and then wheeled off over the surrounding forest.

The Pelican is an exceedingly silent bird, and does not appear to become, like most birds, demonstrative during the breeding-season even. A pair of young birds which I brought round to Galle from the south-east coast used to make a hoarse guttural croak when they saw their food coming, flapped their wings, and darted out their huge bills with an expansive motion of their pouches. They thrived well until the wet damp weather of the south-west monsoon (a thing unknown in their natural habitat on the other side of the island) came on, when they both died.

Nidification.—The Grey Pelican breeds in company with other birds (Hérons, Ibises, and Cormorants), and, doubtless, like them, resorts to the same spot year after year, unless much disturbed, when it will occasionally desert the Pelicanry and carry off its nest to some other secluded spot. One of the longest-known of these interesting places is the Pelicanry at the great tank of Padawiya, concerning which Sir Emerson Tennent has written an interesting account. In the vicinity there are other localities, such as at Sieventhemurippu, where Capt. Wade-Dalton informs me he found a very large colony some few years ago; and, again, there is another spot not far from Tirai where these birds usually breed. I have heard of a breeding-place in the Minery district, and there is a large colony near (Rugam) Rukam tank. In 1872 I found about a dozen pairs breeding at the oft-mentioned Uduwila tank, near the Kirinde Ganga. The nesting-time in Ceylon is between December and March, and by the latter month the young are sometimes nearly all hatched out.

While on a visit to Tissa Maha Rama I heard from a native that there was a place near the river, and about five miles distant from Tissa, where great numbers of water-birds bred. Starting one morning at the usual hour for bullock-cart travelling (2 A.M.), I traversed the dense jungle on the east side of the river, and arrived at the crossing-place of the Hambantota road before daybreak. Here a sparkling stream flowing down the gravelly bed of the river, on either side of which was a broad stretch of cool sand, completely canopied by the foliage of the magnificent Koombook-tree, offered a most delightful spot for outspanning; and so leaving the bullock-cart in charge of the driver, I started with my coolies for the tank, about a mile distant. The day was just dawning, and the harsh call of the Buff-breasted Kingfisher, mingled with the trill of the Red Woodpecker and the voluble notes of the Racket-tailed Drongo, were beginning to break into the stillness of the forest. After striking off the rough track we traversed an open space of long rank grass and vegetation, where paddy had been cultivated some years ago in the upper waters of the tank, and approaching a narrow belt of jungle, which we could not see over, we heard the first indications of the vast bird-colony which had taken up its quarters in the depths of the jungle. Listening to the cries of the hundreds of young birds mingled with the "croaks" of Herons and the *quaks* of Egrets, we stepped through the narrow belt of jungle, I may say, on the tiptoe of expectation, and came in view of one of those wonderful scenes which it is almost useless to describe to those who have not explored eastern jungles.

Teeming tropical nature was just awakening from her slumbers, and hundreds and hundreds of the showiest birds which the island of Ceylon produces were assembled together in the small space of a few acres. An area of about fifty acres, surrounded by luxuriant forest, beneath which was a belt of thorny and almost impenetrable jungle, enclosed the half-dried village tank of Uduwila, reduced to a muddy pond of two or three acres by the drought of several months. In this murky pool, polluted by the droppings of hundreds of huge birds, stood about forty or fifty thorny trees, averaging from 20 to 30 feet in height, and round the edge of the water was a broad expanse of black mud fancifully cracked by the sun and pitted all over with numberless elephant-footprints. All these trees were loaded with huge nests and literally covered with magnificent birds. Rows of elegant White Egrets and Spoonbills, graceful Herons and gaunt Shell-eaters, little groups of stately Pelican-Ibises, their rosy plumage glistening in the rays of the sun, just appearing above the surrounding jungle, colonies of swarthy Cormorants and little assemblies of handsome "Snake-

birds" all lined the overlaiden branches by their nests, or stood like sentinels on the tops of the more distant forest-trees; lastly about a score of huge Pelicans stood on the large platforms of sticks which contained their offspring, and busied themselves preening off the night-dew from their broad backs. But already the numerous assembly had begun to bestir itself, mindful of the labour which those hundreds of hungry mouths entailed during the coming day. Spoonbills and Ibises filed off to distant marshes, Egrets flapped away over the surrounding forest, Cormorants streamed off in rows towards the great tank of Tissa Maha Rama, and several Darters or Snake-birds dashed round and round the tank as if they were training for a race.

It was a sight to have gazed on for hours; but as the sun was fast mounting into the sky and I had come for eggs and specimens, I was obliged to commence work after jotting down in my notebook the different species at their nests so as to identify the eggs. The first shot brought down a splendid Grey Heron which was sailing over my head; and then the scene was instantly transformed, the air swarmed with the assembled multitudes, and the lonely jungle resounded with bird-cries; the Pelicans launched themselves from their nests and, joined in hopeless confusion by Herons, Egrets, Ibises, and Darters, mounted high in the air and soared round and round above their young; but many of each species, more bold than their fellows, dashed about over their nests and furnished me with a few specimens, but only as many as I could carry away, for I never shot a bird I did not want during eight years' hard work collecting in Ceylon. The Shell-eaters, which were the most numerous of all, swooped down on me from vast altitudes as I floundered through the muddy water, regardless of the crocodiles, making a booming sound, and almost touching their nests mounted high again with the impetus gained by their descent. It was no easy matter to ascend the thorny trees slimy and whitened with guana and pervaded with an awful stench. The Pelicans' nests, with which we have now only to do, were very large platforms of moderately sized sticks, the entire structure measuring at least 3 feet across; they were placed on the tops of the largest trees and mostly rested in the forks of crooked and distorted thorn-branches; the top or upper surface was quite flat and lined with good-sized twigs. The companions of the Pelicans were Glossy, Shell-, and Pelican-Ibises and the Little Egret (*Herodias garzetta*). Most of the nests had two or three young ones; but in one or two there were eggs, three being the number of the clutch. They are almost perfect ovals, moderately smooth but chalky in texture, and much smeared with blood and dirt, quite obscuring the original uniform white colour. They varied from 3.0 to 3.2 inches in length by 2.1 to 2.2 in breadth. When I ascended to the nests with young they stood up and stared stupidly at me, but showed no disposition to resist. When seized by the neck they darted out their heads and flapped their wings.

The Pelicanry at Uduwila, which was bodily removed by the birds after my visit, was of course a very small one, these birds being less in number than any other species. Some of those mentioned above are, I understand, tenanted by many hundreds of Pelicans; but even these must be small compared with the vast colony discovered, in November 1877, by Mr. Eugene Oates in the forest near Shwaygheen, and which covers the Pegu plain on the west side of the Sittang river. This vast tract is inundated for five months in the year, forming an immense forest-swamp, just the place of all others to attract Pelicans, and concerning which I transcribe the following passage from Mr. Oates's interesting account:—

"The whole stream from the Sittang to Kadat runs through beautiful forest with spare undergrowth, and in many places the stream narrowed so much that we had carefully to pick a way for the boat between the trees. Immense flocks of Pelicans and Adjutants were flying in circles over our heads the whole day. Monkeys were very common, and I saw more specimens of *Polioætus ichthyaetus* during this trip than I did during the whole of my residence in Burmah.

"We arrived too late in the day to do any thing, but in the afternoon, strolling out, we saw a good many Adjutants' nests; but it was not easy to climb the trees.

"On the morning of the 11th I started early with several Burmans into the forest. The floods had gone down, but the ground was very muddy, and in many places for long distances the water came up to my knees. Every quarter of a mile there was depression or nullah to be crossed, and I soon gave up any idea I might have had of keeping myself dry. Walking was very laborious, for though there was no undergrowth of jungle to speak of, yet roots of trees embedded in mud and water caused me frequently to trip up.

"The whole forest consisted of very large trees, but a portion (about one in twenty) was made up of wood-oil trees, gigantic fellows 150 feet high and more, and with a smooth branchless trunk of 80 to 100 feet high. These are the trees selected by the Pelicans. I was out that day till 3 P.M. continually moving, and

must have walked at least twenty miles in various directions, but never from first to last was I out of sight of either a Pelican's or Adjutant's nest. From what I saw and from what the Burmans told me, I compute the breeding-place of these birds to extend over an area about twelve miles long and five broad.

"I shall describe the Adjutants nests presently; but, with regard to the Pelicans, I noticed that no tree contained less than three nests and seldom more than fifteen. Some birds select the upper branches, placing their nest in a fork; but others, the majority, placed their nests on the nearly horizontal branches of the tree not far from the trunk. In all cases the nests on one branch touch each other, and when these nests were on a horizontal branch they looked like enormous beads.

"Judging from the size of the bird, I should say the nest is about 2 feet in diameter, and, when in a fork, to be about 18 inches deep. Others on flat branches were shallower. They are composed entirely of twigs and small branches; and I could detect no lining in those nests which were thrown down to me.

"The eggs are invariably three in number, and on the 11th of November all I took were either fresh or only slightly incubated. The female bird sits very closely, and frequently I found that the bird would not fly off her eggs till I fired a gun. It was a most ludicrous sight to see the sitting birds stretch neck and head out of the nest to have a look at us, as often happened.

"The only trees which the Burmans can climb on the spur of the moment are those which their arms can encircle. To be able to climb any tree it is necessary to make bamboo spikes the day before. These are driven into the trunk as the man mounts, and the operation, even for the tallest tree, does not take very long.

"Notwithstanding the millions of birds which breed in this forest, a most wonderful silence prevails. The Pelican seems to be perfectly mute, and the Adjutants only bellow at intervals; the only sound which is constantly heard, and after a time even this sound passes unnoticed, is a sort of Æolian harp, caused by the movements of innumerable birds high in the air."

In a large series of eggs taken by Mr. Oates, some are said by him to be so discoloured as to be almost black. The largest measured 3.3 inches by 2.08, and the smallest 2.95 by 2.05.

STEGANOPODES.

Fam. FREGATIDÆ*.

Bill straight and hooked at the tip. Wings very long. Tail long and deeply forked. Tarsus *very* short, feathered. Toes long, only connected at the base by a web.

Plumage illumined with metallic reflections. Chin furnished with a pouch. Sternum with the furcula long and completely joined to the keel; coracoid bones very broad and stout at the base.

* These remarkable birds have all the external appearance of the Raptorial order, to which they likewise assimilate in plumage and somewhat in their mode of living. Notwithstanding, however, their strong affinities with the Accipitres, the internal structure of the Frigate-bird is that of the Pelecanidæ; and this is particularly exemplified in the way the keel of the sternum and the furcula are joined; while also, in the matter of bill and pouch, they resemble the Cormorants. But, in spite of these characters, some learned systematists (and among them the late talented Professor Garrod) have considered the Frigate-birds to form an aberrant section of the Accipitres.

Genus FREGATA.

Bill longer, broader, and more hooked than in *Phalacrocorax*. The culmen flattened, and the lateral grooves pronounced and continued to the tip; margins of both mandibles coinciding; tip of the lower decurved and produced. Wings very long and pointed; the 1st quill considerably exceeding the 2nd. Tail long and deeply forked, of 12 feathers. Tarsus extremely short, not exceeding the hind toe; middle toe lengthened, and the outer longer than the inner; anterior toes connected by a deeply incised web; claws long, curved, and with the inner edge of the middle pectinated.

Of large size; aerial habit. The feathers of the head elongated. Plumage illumined with metallic reflections.

FREGATA MINOR.

(THE LESSER FRIGATE-BIRD.)

Pelecanus minor, Gm. Syst. Nat. i. p. 572 (1788).

Attagen ariel, G. R. Gray, Gen. B. iii. p. 669 (1845, ex Gould, MS.); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271.

Attagen minor (Gm.), Holdsw. P. Z. S. 1872, p. 482.

Fregata minor (Gm.), Buller, B. of New Zealand, p. 342 (1873); Salvadori, Uccelli di Borneo, p. 364 (1874); Sclater & Salvin, P. Z. S. 1878, p. 650; Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Petite Frigate, Buffon, Hist. Nat.; *Lesser Frigate*, Lath.; *Man-of-War Bird*, sailors; *Frigate Pelican* of some.

Adult (Australia; Brit. Mus.). Wing 20·7 to 21·5 inches; tail 13·0 to 14·5, depth of fork 6·0 to 7·5; tarsus 0·7; middle toe 1·85, claw (straight) 0·75; bill to gape (straight) 3·9; length of culmen, exclusive of hooked tip, 2·8. —*Males* (Raine Island; 'Challenger' coll.). Wing 20·5 to 21·0; tail 13·5; bill to gape (straight) 4·1, width at gape 0·93. —*Female* (Ceylon; Poole coll.). Wing 20·2.

Male. Iris red ("black?" in Admiralty-Island specimen, P. Z. S. 1877, p. 555); bill grey; skin of throat red; eyelid black; legs and feet black.

Female. "Iris red; eyelid, legs, and feet red; skin of throat not so red as in the male." (*J. Murray*.)

Male (N.W. coast of Australia). Plumage black, the feathers of the back long and lanceolate, glossed near the tips with lively green, above which the webs are illumined with an amethystine hue, but not bronzed as in the next species; wing-coverts the same; tertials passing into brown at the tips; beneath brownish black, glossed with green and purplish; on the lower flanks a patch of white.

Female (Raine Island). Head and neck black, the feathers glossed with green; back blackish brown, the feathers pointed as in the male; chest, upper breast, and flanks white, passing round upon the hind neck; lower wing-coverts broadly margined with greyish white; pouch not so large as in the male.

The example in the Poole Collection corresponds with these in all respects.

Obs. All examples (so sexed) of females which I have examined have these white markings on the under surface; but I am of opinion that when old they attain the dark plumage, owing to the light coloration being the immature characteristic.

Young in down (Raine Island). White, the down thick and long; the interscapular region and scapulars, which are in feather, blackish brown, with pale margins; bill to gape 2·85 inches.

Immature. "Iris black; bill and feet whitish, with a shade of blue." (*J. Murray*.)

Head, neck, and chest whitish, washed with cinnamon-reddish, passing into brownish on the breast; abdomen white; back brownish; wing-coverts brown, margined with greyish.

FREGATA AQUILA.

(THE FRIGATE-BIRD.)

Pelecanus aquilus, Linn. Syst. Nat. i. p. 216 (1766).

Fregata aquila (L.), Illiger, Prodr. p. 279 (1811); Buller, B. of New Zeal. p. 339 (1873); Salvadori, Uccelli di Born. p. 364 (1874); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Attagen aquilus (Linn.), Gould, B. of Austr. vii. pl. 71 (1848); Jerdon, B. of Ind. iii. p. 853 (1864).

Man-of-War Bird; *Frigate Pelican*.

Adult male and female (Mus. Salvin and Godman). Wing 24·5 to 26·5 inches; tail 17·5 to 18·5, depth of fork 10·0 to 11·5; tarsus 0·8; middle toe 2·0 to 2·2, claw (straight) 0·8 to 0·9; bill to gape (straight) 5·3 to 5·7; gular pouch extending to $4\frac{1}{2}$ inches from the edge of the feathers at sides of lower mandible. The smaller measurements relate to females.

Iris red; bill pale bluish, nail flesh-colour; feet fleshy reddish; gular pouch in the male scarlet.

Adult. Above black, the feathers of the head long and attenuated, those of the hind neck and the uppermost scapular of lanceolate shape, the former glossed with green and the latter with metallic bronze and purple; the wing-coverts likewise with green reflections, and the quills glossed; the lower back and upper tail-coverts with brownish-green reflections; beneath brownish black, glossed on the chest and flanks.

Nestling (British Honduras; May). Covered with white down everywhere but on the interscapular region and scapulars, which are feathered and black, with the tips of the plumes paler; primaries, which are just appearing, black; feet yellowish.

Immature (same locality; May), presumably one year old. Head, nape, throat, chest, and centre of breast white; back and scapulars black, with a slight green reflection, and the edges of the feathers somewhat pale; lesser wing-coverts pale brown, with greyish margins; the median series darker, the greater coverts, primaries, and secondaries glossy black; tail black; flanks and axillaries brown; under wing black-brown; pouch not bare below the gape.

Older bird (May), presumably two years old. Head black, the feathers attenuated and glossed with green; throat and face brown-black; chest and the sides of the breast white, extending almost on to the hind neck; back and scapulars black, more glossy than in the above, and the feathers more lengthened; wing-coverts as in the last.

Obs. In this stage, Mr. Godman informs me, they breed.

Distribution.—I include this species doubtfully in our avifauna, as it is possible that some of the specimens seen from time to time on the west coast of Ceylon may have belonged to it.

It is said occasionally to visit the Bay of Bengal and the Indian Ocean, but rarely strays, writes Sundevall, further north than 10° N. lat. Jerdon includes it in the avifauna of India on the strength of one specimen which was shot on the Malabar coast off Mangalore; but I find no recent record of its occurrence in Indian waters. In the Indian Ocean I have seen what I take to be it between Galle and the Cocos Islands, at which latter locality it is not uncommon. It is found at the Seychelles, Mauritius, Rodriguez, and Madagascar, and to the east occurs throughout the Malay archipelago, being recorded from Sumatra, Java, the Moluccas (Batchian), Halmahera, and New Guinea. In Torres Straits it is not uncommon, occurring all along the north coast of Australia to Cape York, and extending thence eastwards to New Caledonia, Samoa, Society Islands, Palmerston Islands, Marshall Islands, the Phoenix group, and the

Obs. This species, besides being smaller in the wing than *F. aquila*, may be distinguished from it, in the adult male plumage, by the white patch on the flanks.

Distribution.—This fine Frigate-bird is a frequent visitor to the shores of Ceylon, and, as in the case of many other tolerably rare sea-birds, is generally met with on the west coast. Layard, who first recorded it, thus writes (*loc. cit.*) :—"Mr. Brodie, of the Ceylon Civil Service, first shot this species on Calpentyn Lake; and

Sandwich Islands. It has once been procured, in 1863, on the New-Zealand coasts. Crossing the Pacific we find it frequenting the west coast of Central America from California down to Peru; while on the eastern side of the continent it is found along the coast from Bermuda to Florida, where it breeds, and thence southwards to the coast of Brazil. It is common throughout the West Indies. In the Central Atlantic it inhabits the waters surrounding Ascension Island and St. Helena: at the former place it is numerous, for I saw many examples in the course of a day spent there; and at Boatswain-bird Island it breeds plentifully.

Habits.—The "Frigate Pelican" for the most part frequents the vicinity of land, where numbers of sea-birds are usually to be found fishing, and there successfully plies his robber-trade. Occasionally, however, it is to be seen on the open ocean, and I have myself noticed it two days' steam from the nearest land. At Ascension I had an opportunity of witnessing its marvellous powers of flight in chasing the Boobies and Terns (*Sterna fuliginosa*) which thronged the waters round the island.

It is rather an ungainly bird when perched, if one can judge by the appearance of the rather disconsolate-looking captive now in the Zoological Gardens. This individual bobs his head up and down when approached and utters a harsh scream when spoken to by his keeper. The neck is drawn in, and the hind toe is held in rear of the perch.

Audubon, who wrote a graphic description of the flight and habits of this bird, considered it to be much more swift on the wing than the fastest American Hawks. He remarks that it comes "from on high with the velocity of a meteor, and on nearing the object of its pursuit, which its keen eye has spied while fishing at a distance, darts on either side to cut off all retreat, and with open bill forces it to drop or disgorge the fish which it has just caught. See him now! Yonder, over the waves, leaps the brilliant dolphin, as he pursues the flying-fishes, which he expects to seize the moment they drop into the water. The Frigate-bird, who has marked them, closes his wings, dives towards them, and, now ascending, holds one of the tiny things across his bill. Already fifty yards above the sea, he spies a porpoise in full chase, launches towards the spot, and in passing seizes the mullet that has escaped from its dreaded foe. I observed a Frigate Pelican that had forced a Cayenne Tern, yet in sight, to drop a fish, which the broad-winged warrior had seized as it fell. This fish was rather large for the Tern, and might probably be about 8 inches in length. The Frigate Pelican mounted with it across its bill about a hundred yards, and then tossing it up caught it as it fell, but not in the proper manner. He therefore dropped it, but before it had fallen many yards caught it again. Still it was not in a good position, the weight of the head, it seemed, having prevented the bird from seizing it by that part. A second time the fish was thrown upwards, and now, at last, was received in a convenient manner, and immediately swallowed."

Nidification.—The breeding-time of this species on the coast of America is in April; and it may be concluded that in other tropical situations, either in the Indian or Pacific oceans, its time for nesting will be the same. Mr. Salvin found it breeding in high mangrove-trees on islands in atolls bordering the coast of British Honduras. The nests were made on the tops of the trees, and were frail structures of sticks. The young, which looked like puff-balls of white, were lying helpless in the nests, and the "youngest were guarded," he writes, "by one of the parent birds, which balanced itself on the edge of the nest;" and from the unhatched eggs the birds could hardly be prevailed upon to move. Audubon remarks that when commencing to repair their nests "they break the dry twigs of trees with ease, passing swiftly on wing, and snapping them off by a single grasp of their powerful bill. It is, indeed," he remarks, "a beautiful sight to see them when thus occupied, especially when several are so engaged, passing and repassing with the swiftness of thought over the trees whose tops are blasted; their purpose appears as if accomplished by magic. It sometimes happens that the bird accidentally drops a stick while travelling towards its nest, when, if this should happen over the water, it plunges after it and seizes it with its bill before it has reached the waves."

In shape the eggs of this Frigate-bird are moderately broad or long ovals, the diameter varying somewhat; they are of a chalky texture, but the surface is not rough. The colour is a uniform dull white, with smears of blood occasionally. The measurements of three specimens in the British Museum are—2.69 by 1.79, 2.62 by 1.87, and 2.47 by 1.83 inches.

I subsequently saw two, which were killed from the lighthouse in Colombo in February 1853; one passed into my possession, the other into the museum of the Ceylon Branch of the Royal Asiatic Society. I frequently saw them during the month flying at immense altitudes over the coast." Next in order are the observations of Mr. Holdsworth, who writes that he saw them on many occasions at Aripu during the strength of the south-west monsoon, and they were generally in parties of five or six, at a considerable height above the shore. In June 1877 an immature example was shot at Jaffna by Mr. Smart, of the C.C.S. As regards my own experience, I have seen Frigate-birds, both at Colombo and Galle, during the months of May, June, and July. The three examples I observed were all passing southwards along the coast.

The range of this Frigate-bird is not so extensive as that of its larger congener. From the Indian Ocean, to which it can only be considered a frequent straggler, it extends eastwards through the Malay archipelago to Polynesia and the Australian seas, and ranges as far north as the China coasts, where Swinhoe procured it at Amoy. Salvadori records it from Borneo doubtfully, but notes it from Batchian, the Aru Islands, and the Moluccan seas; and at the Admiralty Islands it was obtained by the 'Challenger' naturalists. It has been procured on the south coast of New Guinea, and in Torres Straits it is a common bird. At Raine Island it was found breeding many years ago by Commander Ince, R.N., and more recently by the naturalists of the 'Challenger.' It is further recorded from Port Darwin, Cape York, and Rockingham Bay. On the north-west coast it is equally well distributed. As regards the Pacific Ocean, it is found at New Caledonia, but is said not to extend into Central Polynesia like the larger species. Southwards it extends to the coasts of New Zealand, where it has once occurred; but it has not been observed in Tasmanian waters.

Habits.—Though far less has been written concerning the habits of this species than of its larger congener, the well-known "Man-of-War" Bird of the Atlantic, whose powers of flight were, years ago, so well described by that graphic writer Audubon, yet it possesses the same power of wing and marvellous speed when chasing its prey. No oceanic species has such an expanse of wing, in proportion to the small size and light weight of its body, as the Frigate-bird; not even the Albatross, justly renowned for its length of wing and majestic flight, can boast of so much power in relation to the work to be done, for although its bones are peculiarly light, yet its frame is massive and heavy compared with the aerial form of the Man-of-War Bird. A glance at the living bird or at the freshly killed specimen immediately displays these peculiarities; the immense quills and great length of the ulna- and humerus-bones conduce to form an ample wing which completely hides the almost diminutive frame which has to be propelled. It is no wonder, therefore, that the Frigate-bird sails along against the wind perfectly motionless, as if propelled by some invisible power, or that, in robbing the Gannet or Tern of their prey, a few powerful strokes of its great pinions impart such a momentum that it is enabled to rush like a rocket upon the frightened sea-birds, and catching the fish as it falls from their bills, to rise again on its course as easily as it descended.

The Frigate-bird takes its food entirely on the wing, either pursuing flying-fish, on which it subsists largely, swooping on other sorts which happen to show themselves near the surface, sweeping down on crabs and cuttle-fish, or pursuing Gannets, Terns, and Gulls and catching the food which they drop from their bills before it reaches the water. Commander Ince, in writing to Mr. Gould, remarks that he found in the females of those shot at Raine Island "young turtles, fish, cuttle-fish, and small crabs." I have seen these birds soar round in short circles over a shoal of fish, now and then remaining suspended for a second or two over some particular spot. At this time the wings were kept extended after the manner of a Kestrel's, when it ceases for a moment to ply its pinions. At Galle and Colombo, where I observed the birds spoken of, they were sailing along with their wings quite motionless, and were progressing slowly along against a moderate breeze without any apparent exertion, the secret of which is to be found in the great impetus given to the bird's frame by a few powerful strokes of its immense wings, and which is retained for a lengthened period. Mr. Holdsworth aptly remarks of the examples he saw at Aripu:—"Their action, as they hung as it were against the gale, slowly swaying first on one side, then on the other, strongly reminded me of the behaviour of a large paper kite when it has mounted high in the air." I learn from my correspondent Mr. Parker that the bird shot by Mr. Smart, when wounded, flew at his dog and seized him by the nose, beating the dog off.

Nidification.—Large numbers of this species nest on Raine Islet, in Torres Straits; and there must be other localities in the Australian seas where it breeds. In Raine Islet Commander Ince, R.N., found it breeding on the south-west corner of it, the nests being constructed of small sticks collected from shrubs and herbaceous plants which alone clothe the island. The eggs were two in number, larger than those of the Gannets (*Sula serrator*? and *Sula cyanops*?), and pure white. He remarks that on one occasion he killed the old birds from a nest which contained one young one, and that on revisiting the spot he found the young bird had been removed to another nest, the owners of which were feeding it as if it had been their own.





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APPENDIX I.

Page 17.—*Circus macrurus*. An error in the distribution of this species, with regard to Spain, occurs at p. 19. Col. Irby states, in his 'Birds of Gibraltar,' p. 33 :—"On the Spanish side it is not uncommon in spring near Seville. Lord Lilford was the first to obtain it, in the spring of 1872."

Page 47.—*Neopus malayensis*. This Eagle has lately been procured in Sumatra. Mr. Bock, the collector sent to the island by the late Marquis of Tweeddale, met with it at the latter end of 1878, and it is included by Capt. Wardlaw Ramsay in his list published in the 'Proc. Zool. Soc.' for the present year, p. 14. Wallace is the only other naturalist that has recorded it from the island.

Page 51.—*Spizaetus kelaarti*. I see Mr. Hume, in his republication of my description of this species, considers its validity still a matter of doubt, in spite of my examination of such a large series, and having given a woodcut of the feathers. There can be no question about the matter; and Mr. Gurney agrees with me that it is a good species. This gentleman has received another example, sent by Mr. A. Whyte, of Kaudy, in the summer of 1878; he informs me that it is a very fine specimen.

Page 55.—*Spizaetus ceylonensis*. With regard to my explanation of the plate (p. 60), I regret to say that, after all, the dark bird which was in the Zoological Gardens is not figured. It died, and I sent the skin to Mr. Keulemans; and after keeping it eight months, in spite of my repeated entreaties that the Plate might be done, he drew another bird, which I had previously sent him, and which does not represent the dark race at all!

Page 67.—*Haliaetus leucogaster*. Mr. Parker writes me of a nest he found at Kalpitiya, on April the 3rd, 1880 :—"All round the inner edge of the nest were fish-bones, apparently arranged purposely; under the nest was the skull of a small red deer, showing that these fine birds occasionally kill large game."

Page 72.—*Polioaetus ichthyaetus*. Mr. Parker says, "This Fish-Eagle is rare in the N.W. Province." He only once saw it at Nikaweratiya.

Page 80.—*Milvus govinda*. Captain Wardlaw Ramsay records the obtaining of this species in Sumatra, for the first time, by Mr. Carl Boek in 1878.

Page 94.—*Baza ceylonensis*. It has recently been shown by Mr. Gurney that this new species is not peculiar to Ceylon, and I must therefore expunge it from the list of the "peculiar birds" of the island. Mr. Gurney writes, in 'Stray Feathers,' 1879, p. 445, that he has compared the *Baza* from the Wynaad, sent him by Mr. Hume, with two skins of *Baza ceylonensis*, and that he has no doubt it belongs to the same species. It will be remembered that Mr. Hume was of this opinion at the time he received the specimen himself from the Wynaad (see my footnote, p. 96).

Page 98.—*Baza lophotes*. Mr. Parker found this species common on the road from Padeniya to Anaradhapura from January till March 1880. On one occasion a flock of four were seen together.

Page 101.—*Falco peregrinus*. During the present nesting-season (June 1880), I met with a pair of these birds which had a nest at the celebrated Bird-rock, Merionethshire; they were both in the immature spotted plumage. The female flew round for *five hours* during my stay at the rock, perpetually uttering her querulous cry—*kra, kra, kra, kra*. As an instance of the powers of these birds, I may mention that I was informed by the keeper of the estate that he saw

five Jackdaws struck down one morning in quick succession by the female. The man's remark was that she "seemed to be amusing herself!"

Page 106.—*Falco peregrinator*. Mr. Gurney, who has recently made a critical examination of my Ceylonese specimens and a series of Indian Peregrines from the mainland, is disposed to consider *F. atriceps* from the Himalayas a geographical race of *F. peregrinator*, "distinguishable by its abundant transverse markings, lack of rufous colouring, and prevalent grey tints on the abdominal and tibial plumage." The measurements of an example obtained at Dharmasala are—wing 12.95, tarsus 2.0 inches.

Mr. Parker writes me that he has recently discovered a breeding-place of this Falcon in Ceylon. The eyrie is situated in the face of a large rock near Anamaduwa, on the Puttalam and Kurunegala road. He is informed by a Buddhist priest, who lives there, that a pair breed regularly every year. Captain Wade-Dalton tells me that it was in 1874 he shot his specimen, not 1875.

Page 131.—*Bubo nipalensis*. Mr. Bligh speaks (*in epist.*) of the rapacity of this Owl; a young bird, which was taken from a hole in a tree in Haputale, and not old enough to cater for itself, nevertheless pounced on a village fowl when captured, and tore its head off!

Page 135.—*Scops bakkamuna*. Mr. Hume is at issue with Mr. Sharpe and myself, in the matter of uniting the rufous form *S. malabaricus* with this species. He considers it a good species, and says he has seen it from Ceylon. The only rufous specimens I saw in the island were assuredly nothing but a rufous phase of *S. bakkamuna*, and what I have examined in the British Museum appear to me to be the same. On page 136 I allude to one of these Owls as a rufous variety of the common species. It unfortunately escaped from captivity. It must be remembered there is a rufous phase of *Scops minutus*, and further that the same character exists in other species. Should, however, further investigation prove that this rufous Scops Owl is a good species, and that certain specimens from Ceylon belong to it, then there will have to be added to the avifauna of the island SCOPS MALABARICUS (The Malabar Scops Owl).

SCOPS MALABARICUS, Jerdon, Madr. Journ. xiii. p. 119. no. 43; Sharpe, Cat. Birds, ii. p. 94 (1875, in part); Hume, Str. Feath. 1879, p. 83 (List B. of Ind.).

Ephialtes malabaricus (Jerd.), Hume, Rough Notes, ii. p. 402 (1869).

Adult females. "Length 8.0 to 8.4 inches; wing 5.95, expanse 16.5; tail 2.75; tarsus 1.05 to 1.08." (Hume.)

"Iris dark yellow [that in my specimen, p. 136, was dark brown]; bill yellowish horny, darker above; feet yellow." (*Ibid.*)

Markings as in *S. bakkamuna*; but the parts above which are grey and buff in that species are deep brown and rufous; the chin, throat, ruff, and under surface rufescent, instead of whitish.

Obs. Mr. Hume remarks, in his description, "a good deal smaller" than *S. bakkamuna*; but this is not the case (according to the above measurements) as regards Ceylonese examples of the latter, some females of which measure only 5.7 inches in the wing, and none reach to the limit (6.75) given by Mr. Hume.

Distribution.—Ceylon (Hume); the southern parts of India, more particularly the mountain-regions; East and West Ghats. Mr. Bourdillon has met with this species in the mountains of Travancore; and Jerdon records it from the Malabar coast.

In Ceylon, if such a species is found there distinct from what are unquestionably rufous varieties of *S. bakkamuna*, it will most likely occur in the damp jungle-tracts of the west and south-west of the island, and on the western and southern spurs of the mountain-zone, including the hills of the Kukul Korale and the surrounding wooded tracts.

In its habits and note this species must be quite similar to the Grey Scops Owl.

Page 161.—*Phodilus assimilis*. Mr. MacVicar recently possessed a fine living example of this curious Owl. It lived in captivity four months, and was then killed in order to figure in the Colombo Museum. This gentleman writes me that he put it into a cage with two Little Scops Owls, one of which, he says, appeared to die of fright; the following morning nothing but the legs and head of the other were left! It is no wonder, therefore, that my correspondent remarks that this cannibal was "an awful fellow to eat, though he went about his work very gingerly, with the side of his beak, as it were."

Page 168.—*Palaeornis eupatrius*. Mr. Parker has found this Parrakeet breeding in the N.W. Province, near Uswewa, in February and March. It lays in holes in trees, from 18 to 30 feet from the ground, and chooses open spaces and garden-clearings in the jungle. He has not succeeded in getting the eggs, but took a nest with three young ones; the hole was about 18 inches deep.

Page 174.—*Palæornis cyanocephalus*. In the "Observation" on this species (p. 175) I erred in considering that Gould had, by a *lapsus calami*, inverted the specific names at the heads of the articles on *Pal. rosa* and *Pal. cyanocephalus* in his 'Birds of Asia.' I overlooked his remark "that probably the names of the species would some day require transposition."

Mr. Hume (Str. Feath. 1879, p. 187) takes exception to Mr. Blanford's remark, in his criticism of the "List of the Birds of India," that I had rightly shown the Indian bird to be *P. cyanocephalus*, and refers to the late Marquis of Tweeddale's enunciation that this title belongs to the Burmese race, and says that I must show clearly wherein the Marquis was in error. To which I answer that it is possible the Marquis of Tweeddale was right, but that I do not think the matter is quite satisfactorily proved. This author merely states that Linnaeus's title *P. cyanocephalus*, founded on Brisson's *Psittacus cyanocephalus*, applies to this race (the Burmese). Now it is quite impossible to say what species the *rough woodcut* in Brisson's work is intended to portray. It looks like a young bird; but, whatever it is intended for, it is not sufficient basis on which to determine two species so nearly alike as the Indian and Burmese Rose-headed Parrakeets. If we turn to Brisson's lengthy description in French, we find no mention whatever of the female having the red spot on the shoulder, and we find the under wing-coverts described as "d'un verd d'aigue-marine"*, which is a sufficiently good description of those of our bird, and applies better to it than to the Burmese race, in which this part of the wing is *blue*. On the other hand, Boddaert's plate resembles this latter species more than it does the Indian; and Latham's description of the "Rose-headed Ring-Parrakeet" ('Synopsis'), to which Boddaert refers in giving his name *Palæornis rosa*, applies to both species about equally well. I do not, therefore, consider that there is sufficient evidence to warrant our accepting the mere enunciation that the title *cyanocephalus* should apply to the Burmese bird.

Page 177.—*Palæornis calthropæ*. In my "Observation" on this species I make mention of its near South-Indian ally *P. columboides*, Vigors. Layard, in his "Notes on the Ornithology of Ceylon" (Ibis, 1880, p. 284), refers to a note of Blyth's in the Appendix, No. 2, p. 314, Cat. B. Mus. S. India, on a young male of this latter species sent to this author from Ceylon by him, and remarks that he had overlooked the matter in his catalogue. Now I fear we cannot accept this identification of Blyth's as correct. Certain species of *Palæornis* are quite local, and among these are *P. columboides* (confined to the mountains of Southern India) and *P. calthropæ* (restricted to the hills of Ceylon and their immediate entourage). The latter bird has never been seen in South India, and it is extremely improbable that the former has ever wandered into Ceylon, as every one knows that the *Psittaci* do not straggle in the same manner as *Accipitres* and *Passeres*. Were it a question of a Hawk or a Warbler one would not be sceptical. But as no one has ever heard of the Parrakeet in question being seen or met with in Ceylon since the time Layard is supposed to have procured the young male in question, the natural inference is that the specimen was the young of *P. calthropæ*.

I will, however, give a description of the South-Indian species, so that if it ever does occur in Ceylon my readers may identify it.

PALEORNIS COLUMBOIDES (*Psittacus columboides*, Vigors, Zool. Journ. 1830, p. 274).

Male (Coorg; B. Museum). Length (from skin) to front of cere 14·0 inches; culmen 0·9; wing 5·8; tail 8·5; tarsus 0·5; longer outer toe 0·7.

Iris yellow, bill red; under mandible dark; legs greenish plumbeous.

Head, hind neck, sides of neck, and cheeks delicate bluish slate; lores and round the eye grass-green; from the base of the mandible round the neck a black collar, bordered beneath by an edging of bright green, tinged with bluish; back bluish green, passing into darker green on the wing-coverts; tail greenish blue, the inner webs of the feathers yellow, and the outer edges near the base green; point of the wing blackish slate, passing into dusky green on the rest of the wing-coverts; margin of the median and greater wing-coverts pale tipped; primaries blue, 1st quill black, inner webs (except at the tips) blackish; chest slaty grey, passing into green on the lower breast and abdomen; under wing pale blue, bases of the feathers dark.

Juv. male (Madras). Dusky blue on the head and hind neck; back greenish; wing-coverts and tertials green; point of the wing blackish; rump blue; an incomplete dark ring round the neck; a trace of the green border beneath it; under surface dull green; cheeks greenish.

This fine Parrakeet inhabits the jungles on the mountains of Travancore, the Wynad and Coorg districts, and the Nilghiris. In Travancore Mr. Bourdillou says it does not ascend to the tops of the hills, nor is it found quite at their base.

* "*Aquamarine* includes clear beryls of a *sea-green*, or pale bluish or bluish-green tint."—Dana's '*Mineralogy*,' p. 198.

It affects, according to Jerdon, the depths of the forest ; but Mr. Bourdillon affirms that it is found "on the margin of heavy jungle, but most abundantly in the secondary growth on land which has once been occupied by the hill-men." According to Jerdon, "its flight is rapid and elegant, and it associates in small flocks ; its cry is mellow, subdued, and agreeable, and it feeds chiefly on fruits of various kinds." It breeds in January and February in the natural cavity of a tree, laying from two to four eggs, of a glossy white colour.

Page 180.—*Loriculus indicus*. My readers must note that the figure of the adult on the Plate facing the article on *Pal. calthropæ* is drawn to a $\frac{3}{4}$ scale, while that of the young bird on the Plate facing the article on *Xantholaema rubricapilla* is life-size.

Page 184.—*Picus mahrattensis*. This species, writes Mr. Parker, is very common in the Manaar district, breeding in dead trees, in which it makes a hole about $2\frac{1}{2}$ inches in diameter. The nesting-season is in May.

Page 186.—*Yungipicus gymnophthalmus*. The same valuable correspondent sends me the following interesting note from the Manaar district on this little Woodpecker. Speaking of the nest, which he found on the 8th of April of the present year, he says "it was situated in a dead tree on the side of a paddy-field ; but the tree was so rotten and the branch so weak that I could not obtain the eggs : the hole seemed about 1 inch in diameter and of an elliptical shape, the branch being, at this place, about 3 inches in diameter and slightly sloping, the nest being on the underside. I should not have observed it but for the cries of a Red-fronted Barbet, which probably had a nest in the same tree. The Barbet was perched on the top of one of the higher branches, and was screaming in a most peculiar manner. For a long time I could not discern what was the cause ; but at last I noticed the little Woodpecker very slowly, but yet in a way that showed he 'meant business,' edging herself sideways towards the other miserable bird. After taking a step or two she stopped to tap the branch, and as she approached the Barbet this tapping was quite as loud as of one of the larger Woodpeckers. I was in hopes I should see another battle-royal, like that between the two *Brachypternus ceylonus*" (see p. 204) ; "but when only a few inches separated the duellists the Barbet's little remaining courage gave way and she flew off to another tree. The Woodpecker immediately followed, alighting about a couple of feet below, and at once began quietly to sidle towards the objectionable intruder, pretending all the time to be busily seeking for food, till the Barbet finally flew off." This anecdote is very interesting, as showing the methodical, yet plucky, nature of this pigmy among Woodpeckers.

Page 191.—*Chrysocolaptes festivus*. I have received a very fine example of this handsome Woodpecker from Mr. Parker. It is from the N.W. Province, and is quite as fine a bird as most Indian specimens.

Page 197.—*Chrysophlegma xanthoderus*. Mr. Hume points out (Str. Feath. 1878, p. 517) that Jerdon's name *Picus chlorigaster* has a few months' precedence of Malherbe's, as the number of the 'Revue Zoologique' in which the latter name was published did not issue until the end of 1845, whereas No. 31 of the 'Madras Journal' appeared in February of that year. I had overlooked the precise date, as regards month, in which the number in question of the 'Revue Zoologique' appeared ; and as Malherbe's title (as a MSS. one) dated from the preceding year, 1844, I took it in preference to Jerdon's. The proper name of this Woodpecker is, therefore, *CHRYSOPHLEGMA CHLORIGASTER*.

Prior to my use of Malherbe's name *xanthoderus*, this Woodpecker was known in all Indian writings by the erroneous title of *C. chlorophanes*.

Page 200.—*Micropternus gularis*. This Woodpecker makes its nest in the interior of the pendent nest of the black ant. After devouring all the inhabitants it hollows out the interior, which serves as the receptacle for its eggs. Mr. Parker writes me of one about which there were numbers of ants still unconsumed when he first found it, but the last time the bird flew out they had all disappeared. He was, at the time of writing, awaiting the laying of the eggs.

Page 202.—*Brachypternus ceylonus*. Last year Mr. Parker kindly brought home two eggs of this species which I intended to have figured in my Plate, but they unfortunately were destroyed by a pet dog. They were glossy white and broad ovals in shape. One specimen measured 1.16 by 0.85 inch. A second nest, found in the N.W. Province on the 30th December last, was in a small dead tree about 18 feet from the ground ; the hole was $2\frac{1}{2}$ by 3 inches, a vertical ellipse leading into the middle of the trunk and then down a foot. There were two eggs, "rather pointed at the small end, but not quite similar in shape, one being more elliptical than the other."

Page 205.—*Brachypternus puncticollis*. Mr. Parker informs me that he has seen yellow-backed and orange-backed Woodpeckers on the Manaar and Madewatchiya road, twenty-three miles from the sea ; they were not in company, and he is inclined to think the orange-backed bird (*B. intermedius*, nobis) is a good species. I never met with the yellow-

backed birds so far into the forests as this, and I did not like to split the species into two; but I am convinced that *B. intermedius* is a forest race, if nothing more, of *B. puncticollis*. It will probably have to be added to the list. From observation of both races, which meet in the Giants'-tank district, he finds that they do not associate together, and have slightly different habits, which one can notice better when both are seen in the same locality. It would be interesting to know whether such is the case on the borders of the hill-forests in the south of India. Its note is different from that of the Golden-backed Woodpecker, resembling that of *B. ceylonus*, but not so much a scream, and continued for less time.

The female specimen mentioned in my explanation of the plate (p. 207) has been omitted.

Page 212.—*Megalæma flavifrons*. The bill of this species (Plate to face article on *M. zeylanica*) is wrongly coloured. Almost throughout the entire series of Plates the accurate colouring of the "soft parts," in accordance with my data on the labels of the specimens, has been disregarded by my artist Mr. Keulemans. Alterations had frequently to be made, but in this case the defect was overlooked.

Page 258.—*Zanclostomus viridirostris*. Mr. Parker has kindly presented me with two eggs taken from a nest of this Cuckoo found in the N.W. Province near Uswewa. They are pure white, short, broad ovals, very rounded at the ends, slightly rough in texture, and measure 1.17 by 0.97 and 1.17 by 1.0 inch. They were taken in the early part of 1879.

Page 260.—*Centropus rufipennis*. With regard to this Ground-Cuckoo's habit of killing snakes, I append an extract from some MS. notes of the late Mr. E. L. Mitford, Government Agent at Ratnapura, and one who was an accurate observer of birds. Speaking of one of these birds he says, "I saw the Cuckoo attack and kill a long green whip-snake. It chased the snake through the branches of a tree till it fell to the ground, and then attacked its head from behind. The snake tried to bite the aggressor in the neck, but it seemed to bite only the feathers; and at one time the bird was enveloped in its coil. After disabling it by repeated blows on the head the Cuckoo seized it by the neck and flew off to the jungle, the tail of the snake catching and winding round the sticks and branches it passed over and checking the bird's flight."

Page 275.—*Tockus gingalensis*. This bird will thrive in confinement. Mr. Parker kept one for a month, and it was doing well when a cat killed it. It fed readily on plaintains, given it in pieces, which it tossed down its throat with a jerk of its head.

Page 278.—*Upupa nigripennis*. This species should stand as *UPUPA CEYLONENSIS* of Reichenbach. I erred in using a MS. name, the date of which (though I could not ascertain it from Mr. Gould) is known to have been prior to Reichenbach's *ceylonensis* (1851). Mr. Hume has corrected my mistake (Str. Feath. 1878, p. 517); I did not, however, intend 1856 to stand as the first date for *nigripennis* of Gould.

Page 285.—*Eurystomus orientalis*. This handsome and, in Ceylon, rare species was obtained on the Dammitenne Estate, Lemastota, by a collector of the Colombo Museum, in the early part of 1879; and Mr. Bligh, my informant, saw an example again a week afterwards in the same valley. At this elevation, about 2500 feet, and from that to 1500, I think it is generally seen in the hill-districts.

Page 303.—*Ceyx tridactyla*. On the Arrive aar or Malwatta oya, some distance inland from Aripn, Mr. Parker tells me that this species is as plentiful as the large Buff-breasted Kingfisher, *Pelargopsis gural*. He remarks on their habit of washing themselves, a somewhat abnormal one in a Kingfisher, one would think. They wash like Flycatchers, "darting down from a branch, and barely dipping themselves under water."

Page 306.—*Merops philippinus*. This Bee-cater, which has been recorded by few from Sumatra, is mentioned by Capt. Wardlaw Ramsay as having been obtained there by Mr. Carl Bock in 1878.

Page 309.—*Merops viridis*. The colour of the legs of this species varies. I find it recorded in my field-notes as "fleshy grey;" "brown, with grey edges to the scales;" "brownish;" "blackish, with pale edges."

Page 312.—*Merops swinhoii*. Levaillant's name should be expunged from the synonymy. This species breeds in the North-western Province in April. From the Nikaweratiya district Mr. Parker sends me some particulars concerning its nidification. The nests were excavated in a bank by the roadside near the Deduru oya, and were about 2 feet 6 inches deep, with an enlarged chamber at the end similar to that mentioned at p. 313. Between 7 A.M. and 2.30 P.M. a pair

excavated a hole 8 inches deep; the soil was sandy, such as could be "cut by a sharp-pointed stick without difficulty." One nest contained four eggs of about the same date of laying; another, two young ones and four eggs, one of which was on the point of hatching off, and one perfectly fresh—showing that they are laid very irregularly.

Page 314.—*Chatura gigantea*. Mr. Hume, I observe ("List Ind. Birds," Str. Feath. 1879), still retains the name *C. indica* for the Indian birds. I have shown, on examination of a series from widely extended localities, that the species is decidedly variable in the matter of the *white patches*.

Mr. Bourdillon (Str. Feath. 1878, p. 34) calls attention to the wonderful flight of these Swifts:—"It is magnificent," he remarks; "their speed almost incredible; the rushing noise as they dart through the air quite startling. I was much interested the other day in watching a flight of these Swifts feeding on a crowd of termites that, as usual, were swarming up from their underground nest. I was close enough to see that, at the instant of capture, the Swifts detached and rejected the wings of their prey."

Page 324.—*Collocalia francica*. This Swiftlet is noticed by Capt. Wardlaw Ramsay as having been obtained in 1878 by Mr. Carl Bock in Sumatra.

Page 328.—*Dendrochelidon coronatus*. Males from India have more rufous about the chin and cheeks than Ceylon example; this colour extends from the chin across the lower part of the face to the ear-coverts, forming a conspicuous facial coloration. I do not know whether this trifling difference is constant. The tints of the plumage are otherwise the same as in Ceylonese specimens.

Page 355.—*Oriolus diffusus*. With regard to this title of Mr. Sharpe's, which I adopted for the Black-naped Indian Oriole, and my remarks in the "Observation," setting forth the grounds which that author had for altering the name hitherto employed, I observe a note of Mr. Hume's (Str. Feath. 1878, p. 392, B. of Teuass.), calling attention to facts which I had overlooked. The name *indicus* is one of Jerdon's, not Brisson's, which are indeed, as Mr. Hume points out, inadmissible. The former author observes, in the 'Illustrations of Indian Ornithology,' after remarking on the invalidity of the title *chinensis*, "I have therefore given our peninsular species the appellation of *indicus*, partly because I consider that *O. indicus* of Brisson and others may possibly refer to this, though faultily described." I desire, therefore, to restore the usual title to this bird, and it will stand in the 'Birds of Ceylon' as *ORIOLOUS INDICUS*.

Page 360.—*Graucalus macii*. This Shrike breeds in the North-west Province in July and August. The birds are very partial to Palu-trees, and in them they build, constructing a small nest of grass fixed on a branch, and scarcely visible from the ground beneath. Such a nest, found by an overseer of Mr. Parker's, contained two young birds; another nest, situated at the top of a Palu-tree, and to which this gentleman watched one of the owners carrying grass, was externally a large nest of small sticks (perhaps an old one of some other birds), lined inside with grass and leaves. It was fixed in the fork of a small branch.

Page 366.—*Pericrocotus peregrinus*. Nests of this Minivet found in the Manaar district are described to me by Mr. Parker as beautiful little structures, "made entirely of small leaf-stalks laid parallel, wound round and round with spider's web, and covered all over with little patches of lichen. The nest is," he writes, "always on the top of a small overhanging branch (generally that of a wild mustard-tree); and so cleverly does the colour resemble the bark, that when I found my first nest, not more than 6 or 7 feet from the ground, I stared at it for several minutes before I knew it was one, though I saw the bird fly off it. The nest is firmly glued to the branch, so tightly, in fact, that it must almost be torn off piece by piece. It is cup-shaped, $1\frac{3}{4}$ inch wide and $\frac{3}{4}$ inch deep." The eggs are described as of a delicate rich green ground-colour, spotted with purple; but they fade in about a fortnight after being prepared.

Page 369.—*Lalage sykesi*. In the synonymy I omitted the reference to Mr. Holdsworth's Catalogue, which is Proc. Zool. Soc. 1872, p. 437.

Page 372.—*Tephrodornis pondicerianus*. I am now able to give some particulars concerning the nesting of this Wood-Shrike in Ceylon. Mr. Parker writes me from Manaar of a nest containing two eggs recently found by him:—"It was on the lateral branch of a 'mustard-tree,' near the end, and much resembled the nest of *Pericrocotus peregrinus*, but was flatter and wider, and was made of chips of dead wood, dead grass, and dead lichen, tied together with spider's webs, and lined with the same mixed with a few fine fibres of bark." Its measurements were $2\frac{1}{2}$ inches wide and $\frac{1}{2}$ inch deep, and it was glued to a branch about 7 feet from the ground. Another nest found was constructed in the same manner.

Page 383.—*Lanius caniceps*. Numerous nests of this Butcher-bird have recently been found by Mr. Parker in the Manaar district, where it breeds from the beginning of March to the end of April. "The nests are," writes this gentleman, "almost invariably built in a thick thorny tree, from 7 to 15 feet from the ground, cup-shaped, measuring $2\frac{3}{4}$ or 3 inches in width and $1\frac{3}{4}$ inch in depth, with thick walls made of roots and grasses, often tied together with thread or bits of rag from some neighbouring village, or patches of wild cotton, and lined with fine grasses." They are in most open situations, often on the roadside, without any attempt at concealment, as if the bird trusted rather to the natural protection of the terrible thorns of that district. Mr. Parker writes me further that this Shrike is very pugnacious. A young brood, reared near his bungalow at the Giants' tank, demonstrated their pugnacity in an interesting manner, attacking any thing that came in their way. He observes (*in epist.*), "one of them seemed anxious to fight a squirrel the other day, chasing it for 20 or 30 yards along the compound fence, creeping in and out like a rat. The squirrel seemed undecided whether to be amused or alarmed, but the balance seemed in favour of the latter."

Page 386.—*Buchanga atra*. This Drongo extends inland down the Madewatchiya road from Manaar for 23 miles; so writes me Mr. Parker. It nests at the end of March, building on an overhanging branch among the leaves at the end, and not on a fork, like *B. leucopygialis*. The nest resembles, says this gentleman, that of *Lanius caniceps*, and is not built higher than about 10 feet from the ground. Layard, in his recent paper already referred to, maintains that he found *B. longicaudata* perching on the backs of cattle at Pt. Pedro; but I still retain my opinion that the Drongo found at Jaffna perching on the backs of cattle is the present species. *B. longicaudata* is a forest species. Blyth was not always correct in his identifications.

Page 392.—*Buchanga leucopygialis*. This bird sometimes holds its prey in its foot, after the manner of a Parrot, that is, if the insect it has caught is very large or too bulky to be swallowed instantly. With reference to Layard's remarks (Ibis, 1880, p. 284) as to there being some "confusion under this head," I must refer him again to the working-out of the plumages, whereby he will see I have united the *B. cerulescens*, apud Blyth, from Ceylon, and *B. leucopygialis*; also he will see that my remarks as to the species he found at Pt. Pedro refer to the "light form" of *B. leucopygialis* (*B. cerulescens*, apud Blyth). The true *B. cerulescens* is not found in Ceylon.

Page 399.—*Dissemurus paradiseus*. There appears to be no fixed rule for the shape of this bird's tail in youth! Mr. Parker writes me that on May 7th, 1879, in the Uswewa district, he shot one of two young birds flying about with their mother, which of course had the tail-feathers in the ordinary racket-shape; but those of the young bird were perfectly straight, without a trace of a curl; the other young one appeared to have a similar tail. The specimens referred to in the last paragraph of my "Observation" can, I think, after all, scarcely be considered to form a new race; they simply illustrated cases of abnormal formation of the outer tail-feathers.

Page 404.—*Terpsiphone paradisi*. I omitted to state that males commonly breed in the red plumage; indeed from what I learn it is the exception to find a white male paired in Ceylon, though such is the case occasionally, for the late Mr. Lorenz, of Colombo, who took a great interest in the birds of his native country, wrote me, when I first went to the island, of a pair, white and red, breeding together. Capt. Wade-Dalton has a specimen (white) in which the central tail-feathers are $18\frac{1}{2}$ inches in length, projecting $13\frac{1}{2}$ inches beyond the adjacent feathers. Mr. Wickham, of Holmwood, Lindoola, writes me that he has seen this bird once at his estate, which has an elevation of 5200 feet. This is by far the greatest altitude at which I have heard of its being seen; it was probably on passage across the mountains to the Eastern Province.

Page 417.—*Alseonax muttui*. Capt. Wade-Dalton procured a specimen of this Flycatcher in Kottowe Forest. Collectors for the future in Ceylon should particularly look for this species in the forests during the S.W. monsoon, as further evidence is much wanted to prove that it is not migratory, but peculiar to the island.

Page 446.—*Larvivora brunnea*. I see Mr. Hume uses the later title *L. superciliaris* of Jerdon for this Woodchat. There can be no doubt, I think, that *L. brunnea* was the female of this species, and as such it ought to be the title employed, notwithstanding that it is not very applicable to the male bird.

Page 449.—*Turdus kinnisi*. It is to be hoped that further specimens of this species will be procured in the Travancore hills. I do not think it is as yet *satisfactorily* proved that the race from the latter region is not larger than the Ceylonese, and consequently distinct. I should be glad to see the "Nuwara-Eliya Blackbird" reinstated as a peculiar Ceylon bird.

*Page 451.—*Turdus spiloptera*. Mr. Seebohm classes this and all spotted Thrushes with a pale bar on the under wing as *Oreocincla*.

Page 457.—*Geocichla citrina*. It is now satisfactorily proved that this species is migratory to Ceylon, as I suggested that it must be (p. 458). In October last (1879) an example was captured in the lower story of the Surveyor-General's office in Colombo, Mr. MacVicar being present at the time. Like the Ceylon Rail, which is found in houses about Colombo, it had just landed and taken refuge in the large building in question. It is evident that the bird shot by the late Mr. F. Gordon at Jaffna was likewise a new arrival in the island.

In my note, p. 158, on *Geocichla rubecula* from Java, I have erred in stating that it has no wing-spot. It is *G. albogularis*, Blyth, common in the Andamans, which is devoid of the bar on the wing-coverts.

Page 477.—*Rubigula melanicteria*. The tail of the figure of this species has been coloured too hard a green.

Page 482.—*Pycnonotus hæmorrhous*. I hope that Mr. Hume will see his way to restoring this bird to its old-established genus *Pycnonotus*, for which he has substituted a new one (*Molpastes*), under which this bird and its allies are placed in the "List of the Birds of India."

Page 507.—*Alcippe nigrifrons*. Eggs recently received from Mr. Parker entirely resemble those in my own collection taken in the north. There is a little variation in the size, one of the specimens measuring 0·77 by 0·55 inch. On the whole the eggs are very large for the bird.

Page 509.—*Pellorneum fuscicapillum*. The nest of this species was found by Mr. Parker in the N.W. Province, and one of the eggs kindly given me by him is figured (No. 17) on the Plate. It is a moderate oval in shape, slightly compressed from the middle to the small end; the markings are pale red-brown, arranged in the form of a confluent cap at the large end, from which small specks and larger blots diminish towards the small end. The cap is overlaid with brown blotches in the form of a zone near the end. Dimensions 0·78 by 0·55 inch.

Page 520.—*Prinia socialis*. Through the kindness of Dr. Edie, of the Madras Museum, I now possess two specimens of *Prinia socialis* from Collegal, S. India, which, on comparison with my Ceylon skins, prove to be slightly different, though not quite so much so as Sykes's type, referred to in my article. They are two males, measuring—wing 1·9–2·0 inches, tail 2·2–2·4, tarsus 0·8, middle toe 0·52, bill to gape 0·62–0·65.

The wing-coverts and secondaries are edged, as in Deccan birds, with brownish rufous, the upper tail-coverts are tinged with the same, and the tails are paler brown, with the subterminal bar smaller than in the Ceylonese form. The difference in the wing-colouring is very conspicuous, almost as much so as the much greater length of tail. These specimens form a link between the Deccan birds and the Ceylonese, but resemble the former more than the latter; our bird should therefore stand, in my opinion, as *PRINIA BREVICAUDA* (*vide* p. 521), a new subspecies apparently peculiar to Ceylon, but which, I regret to say, it is now too late to figure.

Page 529.—*Drymeca insularis*. Dr. Edie, of the Madras Museum, has kindly sent me three specimens of the small Wren-Warbler (*D. inornatus*?) from South India. There is but little difference between them and our Ceylonese birds which I have given the above title to, and I do not think it will eventually stand, although, so far as I can judge from a limited number of Indian specimens, these South-Indian birds are different from Sykes's type noticed in my article. Then, again, do they lay spotted eggs, or eggs marked with hair-like streaks?

Page 532.—*Schoenicola platyura*. The article on this species should, perhaps, not be placed as a footnote in this work, as there is no question about the bird (so says Mr. Sharpe) having been procured in Ceylon. My reason for so treating the notice of this species was that the bird was not satisfactorily determined. As I said before, I do not see how we are ever to ascertain what *Schoenicola platyura* of Jerdon really was.

Page 541.—*Acrocephalus stentorius*. Mr. Parker found this Warbler numerous in January last, at Ataragalla tank, which is not far from Balalli, on the Anaradhapura road to Wariyapola.

Page 555.—*Phylloscopus viridanus*. Layard (Ibis, 1880, p. 285) is in error about the fourth species of *Phylloscopus*, which, he says, I have overlooked. *Phyllopneuste montanus* (Horsfield), apud Blyth, Cat. B. Mus. As. Soc. no. 1105, is *Phylloscopus proregulus* (Pall.), apud Blyth, J. A. S. Beng. xxiii. p. 488, the species now known as *P. superciliosus* (Gmel.), which has never been recorded from Ceylon. The skins which were identified by Blyth as *P. montanus* from Ceylon were doubtless the examples of *Acrocephalus dumetorum*, Blyth (a common bird and abounding in bushes in the Jaffna peninsula), which appears in Blyth's Catalogue as *A. montanus* (Sykes), a specimen of which, collected by Mr. Layard in Ceylon, is there recorded. Blyth altered the name *A. montanus* to *A. dumetorum*, because he discovered that the *Sylvia montana* of Sykes was not the same species as the *Sylvia montana* of Horsfield, and that since the latter name had the priority of date, the former name must be laid aside as a preoccupied synonym, and a new name must be provided.

Page 566.—*Cinnyris asiaticus*. Through some inadvertence I have spoken of the nest noticed by Mr. Holdsworth as being in his bungalow at Aripu, instead of in a rest-house in the south of the island.

Page 572.—*Cinnyris minimus*. Layard confirms my supposition that it was at Pt. Pedro where he found this species "not uncommon" (*Ibis*, 1880, p. 280).

Page 574.—*Dicaeum minimum*. This little Flowerpecker is identical with the *Certhia erythrorhyncha* of Lath. Ind. Orn., and must stand in this work as *DICAËUM ERYTHORHYNCHUM*, Latham, Ind. Orn. i. p. 299 (1790). Mr. Parker writes me of a nest of this tiny bird, recently found at the Giants' tank, and which was suspended from the end of a leafy bough about 5 or 6 feet from the ground. The opening was at the side, and the top was covered over by a hood, as in the nests of *Cinnyris*. The character of the nest is therefore intermediate between that of *Cinnyris* and *Piprisoma*. It contained three young ones almost fledged, which quite filled up the nest.

Page 579.—*Piprisoma agile*. Mr. Parker has sent me a beautiful nest of this little bird, taken in the N.W. Province. It is one of the most remarkable nest-structures that can be imagined. It resembles exactly a brownish-red felt purse suspended to a little branch, with a large opening at the top, extending down the front somewhat. The material is of the consistency of loosely-woven flannel, and the whole nest is entirely in one piece, so that were it not attached to the branch it could be turned inside out like a stocking. It is made of the small brown stamens of some flower, evidently agglutinated to a framework of cotton and spiders' webs, and is about $\frac{2}{3}$ inch thick in some places, in others not more than $\frac{1}{8}$. From the point of suspension to the bottom of the nest is $3\frac{1}{2}$ inches, the greatest diameter of the purse is 2 inches, and the length of the opening $1\frac{3}{4}$ inch by 1 inch in breadth.

Page 579.—*Prionochilus pipra*. Count Salvadori, in 'The Ibis' for January 1880, p. 144, corrects my mistake with regard to this species being a made-up bird, and points out that it is a South-American species of the genus *Iodopleura*.

Page 598.—? *Cotyle obsoleta*. I find, on looking over old letters received from my correspondent, Mr. Parker, that he has observed, at Anaradhapura, a Martin which would appear to be the same as Mr. Bligh's Haputale bird. It is, however, possible that it may be the Common House-Martin (*Chelidon urbica*, Linn.), which visits the Nilghiris occasionally.

Page 633.—In my article on the Indian Sky-Lark, I have referred in the *note* to a further species, to be treated of in the Appendix, concerning which I now have to remark that I am unable to deal with it as satisfactorily as I expected, owing to my not having heard from Mr. Hume as to his opinion concerning the specimen of this race which I sent him twelve months ago last August. Absence from his museum at Simla has, I presume, prevented his comparing the specimen with a requisite series.

On the 27th of June, 1873, I shot a pair of Larks out of a small flock of a dozen or so that were feeding gregariously on the bare plains near the leways at Hambantota. They differ from all other specimens of Larks I have met with in Ceylon in their small size and proportionately stout *Mirafra*-like bill. They are changing from the first or nestling-plumage to the mature dress; and were it not for the stout bill, their small size would indicate them to be the young of *Alauda gulgula*. The specimens, which are males, measure:—Length 5.75 to 6.0 inches; wing 3.1 to 3.05; tail 1.8 to 1.85; tarsus 0.95; middle toe 0.55; hind toe 0.45, its claw (straight) 0.53 to 0.55; bill to gape 0.64, at front 0.5. The bill is considerably stouter than that of fine specimens of the Indian Sky-Lark, but has not the massive curved form of the bill of the *Mirafra* or feathered-nostrilled Larks, nor such a conical one as *Spizalauda*.

Iris fulvous brown; bill and upper mandible blackish, with a pale edge, lower mandible fleshy; legs and feet olive-brown, joints dark plumbeous.

The feathers of the head and interscapular region are black, the margins rich rufous on the head, rufous-grey on the back; wing-coverts and tertials broadly margined with rufous; the primaries edged outwardly with rufescent white; the nestling tail-feathers are very pointed; the lateral newly-acquired ones rufescent white, with dark inner edges; lores and a broad supercilium rufescent white; the new feathers of the throat and chest pale rufous, as also those of the thighs; the nestling-feathers of the under surface whitish; across the chest the feathers are striped with dark brown.

The second example has none of the bright rufous coloration of the one described.

I compared both with a specimen of *Alauda malabarica*, the South-Indian form of Sky-Lark, sent to me by Canon Tristram, as also with examples of *Spizalauda deva*, lately contained in the India Museum, and I do not find that it corresponds with either. Owing, however, to the very poor series of Indian Larks to which I have had access, I am unable to declare this Ceylonese form to be new or not. If it be so, I would propose the name of *Alauda parkeri*, in honour of my valued correspondent, Mr. H. Parker, of the Ceylon Public Works Department.

Page 646.—*Ploceus manyar*. Captain Wade-Dalton writes me that he has shot this Weaver-bird near Buttawa.

Page 673.—*Pastor roseus*. The year in which Mr. Holdsworth saw a flock of these birds at Aripu was of course 1866. The printer's error, "1856," was overlooked by me.

Page 687.—*Pitta coronata*. Mr. Holdsworth tells me that he has not only heard this bird at Nuwara Eliya in August, but that he has *seen* it more than once there in that month.

Page 702.—*Turtur risorius*. This Indian Turtle-Dove, Mr. Parker tells me, breeds in the Manaar district in April and May. The nest is at varying heights from the ground, and is a thin structure of sticks, like that of the Spotted Dove (*T. surattensis*).

Page 711.—*Turtur pulchratus*. Captain Wardlaw Ramsay thinks that Eversmann's title (*Columba ferrago*, Add. ad Zoogr. Rosso-As. iii. p. 17, 1842) ought to apply to this species, as he described an Asiatic Turtle-Dove having the tips of the rectrices white; whereas Hodgson's name *pulchratus* was bestowed on a bird in Gray's Zool. Miscell., without giving any description. He points out an error I fell into in saying that Latham did not mention what colour the under tail-coverts were in *Turtur orientalis*. I had only referred to his 'Index Ornithologicus,' where such is the case; but in his 'General Synopsis,' ii. pt. 2, p. 647 (1783), he describes the under tail-coverts as "pale cinereous grey."

Page 718.—*Carpophaga aenea*. Mr. Parker, who, I imagine, is the first collector who has taken the eggs of this fine Pigeon in Ceylon, writes me of a nest he found in dense forest in the Uswewa district. It was built of thin twigs, about 20 feet from the ground, in a thick young tree. It contained two eggs, which were unfortunately broken; they were elliptical in shape, and considerably larger than those of the Green Pigeon (*Osmotreron pompadora*).

Page 725.—*Osmotreron bincincta*. The same gentleman has sent me an egg of this species, taken by himself. It is a broad ellipse, and almost the same at both ends, pure white, and measures 1.08 by 0.87 inch. Another nest, found by him in thick forest, is described as constructed in the slightest manner of twigs, about 8 feet from the ground, near the end of an overhanging branch.

Layard reiterates (Ibis, 1880, p. 283) his assertion that this bird has a plaintive whistle. It may be so; but I have heard it make a hoarse croak, and always remarked that it was a much more silent bird than the Pompadour Pigeon.

Page 728.—*Osmotreron pompadora*. Mr. Parker informs me that nests of this Pigeon are common in the north-west in forest in May. They resemble those of the above-mentioned, and were situated at heights varying from 10 to 40 feet; the bird usually prefers the leafy top of a young tree 15 or 20 feet high, but will build also on the overhanging branch of a Bo-tree. The nest is a very thin structure.

Page 736.—*Gallus lafayettii*. As I have given two Plates of this bird, it is necessary to alter the description of the Plate, last paragraph on p. 740, as follows:—The figures on the first Plate represent a cock from the Trincomalie district and a chick shot on the summit of Allegala Peak; those on the second Plate, a female from the Wellaway Korale and an immature male bird from the Kandy district.

Page 755.—*Coturnix chinensis*. I have a specimen of this bird's egg now in my possession, taken at Bolgoda in September. It is yellowish olive, speckled with small clearly-defined specks and points of brownish red; the larger end is almost devoid of the latter markings, but shows the fine though open stippling only with which the egg is covered beneath the specks. It is a broad somewhat pointed oval, and measures 1.03 by 0.77 inch.

Page 761.—*Turnix taigoor*. Captain Wardlaw Ramsay records this Quail as having been procured by Mr. C. Bock in Sumatra. This is the first time that it has been obtained in that island.

Page 781.—*Gallinula chloropus*. A second example of this species was obtained last December at Nikaweratiya.

Page 800.—*Rhynchaea capensis*. Captain Wardlaw Ramsay records the procuring of this species in Sumatra by Mr. Carl Bock in 1878.

Page 821.—*Gallinago scolopacina*. According to Mr. Dresser the Common Snipe should be called *Gallinago coelestis*, a name given by Frenzel in 'Beschr. der Vögel und ihrer Eier in der Gegend um Wittenberg,' p. 58 (1801). It would, perhaps, be well if this name were adopted by British ornithologists, as it is peculiarly adapted to the habits of the bird in the breeding-season. The title *gallinaria*, as I have already stated, is wholly inapplicable.

It is a pity that Mr. Dresser adopts Herr Meves's tail-theory of the Snipe's drumming, after what has been written by Mr. Hancock and others. In my article on this species, printed on the 13th of January last, and written after I had myself carried out the experiments on which Herr Meves's hypothesis was based, I showed that the conditions under which the tail-feather is moved with the stick and wire on the one hand, and with the caudal vertebræ of the bird on the other, are totally different, and that though a noise may be produced like the Snipe's drumming with the one means, it cannot possibly be by the other. With the intention of referring again to the matter in the Appendix, after I should have had an opportunity of observing for myself, I repaired this season to the breeding-grounds of the Snipe in Mid-Wales, and there had an admirable opportunity of verifying Mr. Hancock's theory that the sound is chiefly made by the wings; and I am now perfectly satisfied that this is the case, notwithstanding that the tail is spread during the performance. I went there partly convinced in my own mind that the sound was a vocal and at the same time a mechanical one—that is, that it was made in the same manner as has been observed in the case of the Great Snipe, with the bill and throat; but it only requires close, very close, observation and good hearing to come to a right conclusion in the matter. The most favourable occasion I had for observation was on the evening of the 10th of June, when the same Snipe, having young near where I was standing, drummed over my head, flying backwards and forwards in the manner now to be described, without cessation, for a period of fifty-two minutes, timed by my watch! It was a calm evening on an immense bog, with the sun gradually sinking behind the wild surrounding hills; and as I stood, binoculars in hand, and with my wire and tail-feather for purposes of comparison of sound, intently watching the remarkable performance of the interesting bird, the time flew rapidly by, and I do not think I ever spent a more pleasant hour in the observation of Nature. There were other birds drumming all round me, for the evening is the time for this performance; but I gave my undivided attention to the one which I had particularly alarmed by my proximity to her young.

The aerial course taken by the bird was an ellipse, of the average length of a quarter of a mile, described over where I stood; but it was sometimes varied by her making a figure of "S" above my head, the bird always returning to its original starting-point in the air and again making the same tour. The movement for the purpose of drumming was generally performed twice, but sometimes thrice, going and coming, making from four to six times in each figure described. It flew at a height of about 100 yards with a quick and regular movement of the wings, and drummed in this wise:—the body was suddenly turned on one side and the bird descended rapidly for about 100 feet at an angle of 45 degrees, moving its wings with very rapid and powerful *strokes*, its tail being at the same time opened to the utmost; having arrived at the lowest point of its descent it suddenly turned its body in the reverse direction, that is, elevated the wing which had been before depressed, and with a short upward sweep ceased the drumming noise and rose to its original position, continued its course for a short distance, and then descended with the same rush again. The movement was always performed with the same wing pointed downwards throughout one half of the bird's course; that is, if it commenced to drum with the left wing down when flying from east to west, that wing was inclined downwards the next time it descended, until the course was altered, and the bird flew back from west to east, when usually the other wing was inclined towards the earth. The instant the bird commenced its descent the drumming noise was heard, and it continued till it finished off with a sort of whiz directly the upward sweep, by which the bird recovered itself, was performed. By closely watching the bird it could be distinctly *seen* that the vibrations falling on the ear *coincided exactly with the beat of the wings*, which, assisted by the downward rush through the air, were the *primary* cause of the sound. The tail, however, was spread, as I have already remarked, and to such an extent that it took the form of a fan, the lateral feathers being at right angles to the centre; and herein lies the *secondary* cause of the sound. During the drumming-beats of the wing the quills are more drawn back than in the ordinary strokes (this can be observed if the bird be closely watched), so that the atmospheric wave or air propelled by the powerful stroke of the wing is driven through the rigid, sabre-shaped, and opened-out feathers of the tail, thus making the peculiar noise. If a succession of quick puffs emitted from the lips be brought to bear upon the opened-out tail of a Snipe a peculiar noise is produced, which is analogous to that made by the much more powerful agency of the wings of the bird during the rapid downward rush through the air which it resorts to when drumming; and as the peculiar sound is unquestionably coincident with the beating of the wings, it can only be accounted for on the hypothesis here set forward.

Page 828.—*Gallinago gallinula*. Mr. Simpson, of the Indian Telegraph Department, shot another of these Snipes at the Palverainkadoo lagoon in March last.

Page 885.—*Tringa ruficollis*=*T. albescens*, Temm. With regard to the observation on this species in my article on *T. minuta*, I notice that Mr. Hume recently records this species from the Malay peninsula. I have already stated that I do not think any of the larger specimens of Stint procured by myself in Ceylon belonged to this form; but it is possible that it may visit the island, which would, in that case, be the westernmost limit of its range.

To follow my article on *Limicola platyrhyncha* is the following on an additional species:—

Genus CALIDRIS.

Similar to *Tringa*, but with hind toe wanting.

CALIDRIS ARENARIA.

(THE SANDERLING.)

Tringa arenaria, Linn. Syst. Nat. i. p. 251 (1766).

Charadrius calidris, Linn. Syst. Nat. i. p. 255 (1766).

Calidris arenaria (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 270 (1849); Jerdon, B. of Ind. iii. p. 694 (1864); Heuglin, Orn. N.Ost-Afr. ii. p. 1196 (1873); Hume, Str. Feath. 1873, p. 244, et 1876, p. 465, et 1879 (List B. of Ind.), p. 113; Dresser, B. of Europe, pt. 59, 60 (1877); Feilden, Ibis, 1877, p. 406.

Ruddy Plover, Lath.; *Yamgchurchi*, Turkestan.

Adult male. (Ceylon, 10th Dec. 1879) "Length 7.75 inches; wing 4.75; tail 2.0; tarsus 1.0; middle toe 0.75; bill at front 1.0" (*Italy*). (Sindh) "Length 7.5; wing 4.7; tail 2.0; tarsus 0.92; bill at front 0.93; weight 1.7 oz." (*Hume*).—*Female* (Turkestan). "Length 7.8; wing 4.73; tail 1.95; tarsus 1.0; bill from gape 1.1" (*Scully*).—*Male*. (Missolonghi, Mus. Harting) Wing 4.75; tail 2.0; tarsus 1.0; middle toe and claw 0.8; bill at front 1.0. (South Africa, Mus. Harting) Wing 5.0; tail 2.3; tarsus 1.03; middle toe and claw 0.75; bill at front 0.98. (New Jersey, North America) Wing 5.2; tail 2.4; tarsus 1.1; middle toe and claw 0.75; bill at front 1.07.

Iris brown; bill black; legs and feet black.

Breeding-plumage (Missolonghi). Feathers of the head, lower hind neck, interscapulars, and scapulars black, with broad lateral rufous margins and tips of white, the latter broadest at the ends of the longer overlying scapulars; forehead and hind neck brown, with greyish rufescent edgings to the feathers; in front of the eye a black border preceded by rufous, black-centred feathers, which spread down over the fore neck and throat, where they are conspicuously tipped with white; on the sides of the chest these markings take the form of crescentic bars near the tip; under surface, with the under tail-coverts and under wing, white; back and rump blackish brown, the feathers tipped in some parts with white, in others with rufous; upper tail-coverts black, with the same markings; tail brown, the inner webs of the two centre feathers blackish, the margins of the whole white; lesser wing-coverts blackish brown; median and greater brown, tipped with white; primaries and secondaries blackish brown; the shafts white, with the 2nd brownish at the base; tips and outer edges of the secondaries white; edge of the wing beneath brown; inner primaries with the bases of the outer webs white.

Another example from New Jersey, the measurements of which are given above, is in a peculiar pale phase of plumage:—Crown, interscapulars, and scapulars black, with broad white edgings, taking the form of marginal spots, on the scapulars; a dark patch through the lores; space above them, forehead, entire under surface, and neck white, the feathers at the back with pale brownish central streaks; point of the wing blackish brown; most of the remaining wing-coverts white; quills as above, but with more white at the base of the inner primaries; back and rump smoky blackish, tinged with buff, and with an almost straight transverse mark near the tip; tail whitish, passing into brown on the outer webs and at the tips of the feathers; the central feathers more darkly coloured than the rest.

Winter plumage (South Africa). Above pale cinereous, the forehead, face, and all the underparts white; the shaft-streaks of the head-feathers blackish brown; the hind neck pale greyish; shaft-streaks of the back-feathers brownish; rump darker than the upper back; tail pale brownish, edged with white, the outer feathers tipped with dark brown; lower wing-coverts brown; wing as in summer plumage.

Young (half-fledged nestling). Back and scapulars black, with rufous-buff edgings; head dark brown, the feathers edged with buff, which colour overspreads the back of the neck; through the lores a black stripe, and a smaller more indistinct one along the cheek; wing-coverts greyish cinereous; median and greater series tipped broadly

with white; a pale stripe above the eye; sides of the chest deeply tinged with buff; fore neck washed with buff (from Plate in Dresser's 'Birds of Europe').

Immature, first autumn (Wales). Interscapular region dark brown, with terminal buff-white spots; the scapulars with broader spots; the outer feathers with broad buff margins; the lesser wing-coverts at the point of the wing blackish brown; the greater series buff, with dark terminal bars; outer tail-feathers nearly white; face white, the lores pencilled with brown; the throat and chest faintly tinged with buff; the chest-feathers marked with fine cross pencillings.

Distribution.—This interesting and widely spread Stint has recently been procured in Ceylon. On the 12th of last December (1879) the collector of the Ceylon Museum met with a flock on one of the little islands at the mouth of the Negombo Lake, but only succeeded in shooting one specimen, a male in adult winter plumage. It is not unlikely that the Sanderling may visit the shores of Ceylon yearly as a straggler, and be completely overlooked, as comparatively few of the myriads of shore-birds frequenting the coasts in the cool season are ever shot.

In February 1875, Mr. Hume met with this species at Betra-par, one of the reefs in the Laccadive group. It may be, perhaps, not unfrequent on the coasts of Southern India; but it does not seem to have been often noticed there. On one occasion Jerdon encountered it at Nellore, and writes that it appeared to him to be tolerably abundant; but not knowing that it was rare in Indian collections, he only secured one specimen. I do not see it recorded from Bengal; but beyond the Bay it occurs along the coast at the mouths of the Irrawaddy, in which locality Dr. Armstrong met with it rarely. In Tenasserim, however, it has not yet been noticed; neither has it been seen on the shores of the Malay peninsula, although Schlegel records it from Java. It may not, therefore, range further south in this direction than the last-mentioned locality, although it extends eastwards into China, being general there in winter, according to Swinhoe.

In North-western India it is more abundant than elsewhere in the empire; for Mr. Hume found it common in Knrrachee harbour, and Mr. James writes of it occurring at Mandavee; it has also been met with in Sindh by Major Le Messurier. Northward it is found in Eastern Turkestan in autumn, migrating southwards, according to Dr. Scully. It probably passes through this country in spring, as Severtzoff says it occurs on passage in the north-eastern part of the country. As in Europe so in Asia, it reaches very high latitudes in summer, breeding in the very extreme north of Siberia on the Boganida, and frequenting likewise the Taimyr river as high as 74° N. lat. (*Middendorff*). Eastward in Japan it has been found on the south coast of Yezo. Turning westwards we find Canon Tristram procuring it on the coast of Palestine in winter. As regards the continent of Europe, it may be said to be a bird of passage throughout the southern portions generally, being found in some parts, particularly on the south coasts of Spain and in the Mediterranean islands, during the winter. In Great Britain it is likewise a bird of passage, though some, mostly young birds, remain throughout the winter; in Scotland it is common in autumn. In Scandinavia it is likewise a migrant, being observed in Norway and Sweden in spring and autumn; it passes through the Faroes, and is common in summer in Iceland. On the European shores of the Arctic Ocean it is also found in the breeding-season, although its nest has not yet been found there. Messrs. Seeborn and Harvie Brown met with it on the Golaievskai Islands, at the mouth of the Petchora Gulf, and also saw it at Dvoinik; but their visit was so hurried to these places that they failed to discover its eggs. Further east Von Henglin has met with it on Waigats Island and the south of Nova Zembla; finally, as regards Russia, it has been procured on passage south at Kasan, and on its way north in spring on the Spars.

In Northern Africa it is found in the winter, many remaining in Morocco during that season, as also in Algeria and Lower Egypt, on the coast of which latter country Heuglin procured it in April and May already in summer plumage. In autumn and winter this naturalist says it is very common on the shores of the Red Sea, as far south as the Gulf of Aden. He found it most plentiful on the Somali coast in October and November, but never observed it on the Nile. On the east coast of the continent it has been recorded from Mozambique and the coast of Natal, and on the island of Madagascar Mr. E. Newton procured it. It is a winter resident in Cape Colony, and is found on the west coast at Benguela, Gambia, Bissao, the Gold Coast, and Sierra Leone, taking in likewise the Canary Islands and Madeira into its range.

Dealing now with the Nearctic region, we find it on the east coast of Greenland breeding on Sabine Island, where the eggs were taken in 1869 by the German North-pole expedition. On the western side, Capt. Feilden met with it on the shores of Grinnell Land, but not abundantly; he, however, was fortunate enough to find it breeding in lat. 82° 33' N., in the month of June, and met with *young* birds in August on the shores of Robeson's Channel. In North America it has been obtained in the Hudson's Bay territory and on the Mackenzie and Anderson rivers. Along the west coast it has been found from Alaska down to Cape St. Lucas, and also in the Aleutian Islands. Messrs. Selater and Salvin record it from Peru, southward of which it has been met with on the coast of Chile; and in Central Patagonia Mr. Durnford procured it in the month of December at Tombo Point. Down the east coast of North America it has been procured in various places, and likewise visits Bermuda and also the West Indies, as Gundlach records it from Cuba. Finally we have it noted from Brazil.

Habits.—This cosmopolitan Stint resembles the rest of its family in its habits and economy, associating, however, not unfrequently with Sand-Plovers, to which, in the absence of its hind toe, it bears a trifling resemblance. It also consorts with larger birds, such as Oyster-catchers and Godwits. Von Heuglin remarks that it carries its neck more drawn in than other Stints, and also the bill and head more forward. When flying, and also on the approach of danger, he observes that it utters its note, which he likens to *zi* or *schri*. It is less active than these birds in its movements. Captain Feilden found it feeding in the far north on the buds of the *Saxifraga oppositifolia*, a diet which Knots and other species likewise take to in those regions. He also observed small parties of young ones following their parents, and searching most diligently for insects.

Nidification.—Although the Sanderling has such a wide circumpolar distribution, its eggs have very seldom been found, and as yet they have only been taken in very high latitudes. Macfarlane found a nest with four eggs on the Anderson River, and describes it as composed of hay and decayed leaves. One of these eggs was exhibited by Professor Newton at a meeting of the Zoological Society in 1871, and is figured on pl. iv. fig. 2 of the 'Proceedings' for that year. The same naturalist exhibited in that year the eggs sent from Dr. Finsch as having been procured on Sabine Island, and which agreed with that from Anderson River. Another egg, bought in Iceland in 1858 by Professor Newton and Mr. Wolley, is identified as being almost unquestionably a Sanderling's.

The nest Captain Feilden found "was placed on a gravel ridge, at an altitude of several hundred feet above the sea; and the eggs were deposited in a slight depression in the centre of a recumbent plant of arctic willow, the lining of the nest consisting of a few withered leaves and some of the last year's catkins." "The eggs," writes Mr. Dresser, "may best be described by comparing them to miniature Curlew's eggs of a pale colour. In size they are about equal to those of the Wood-Sandpiper."

Page 900.—*Streptilas interpres*. Two specimens shot on the coast of Wales in full breeding-plumage, on the 27th May, demonstrate the superior size of the female; the measurements are as follows:—♂, wing 5.9 inches; ♀, wing 6.1.

Page 934.—*Charadrius fulvus*. With reference to Layard's statement, in the 'Ibis,' 1879, that this Plover breeds in New Caledonia, and to which I refer at page 936, he writes me recently that there is no question about the matter, and that had his son known that the species had not hitherto been found breeding south of the equator, he would have shot specimens of old and young. While on the island referred to (Anseвата) the birds were several times close to him, so that he could not be mistaken in his identification.

In Mr. Parker's last letter is contained a very interesting announcement concerning this species, namely that Mr. Goonewardene, Assist.-Sup. of Tanks in the N.W. Province, had sent him a Golden Plover's egg, *taken out of a bird shot in April*. It is difficult to believe that this example would not have bred in low latitudes. Some of the eggs brought to Swinhoe in Formosa may, after all, have been those of this species.

Page 1059.—*Podiceps fluviatilis*. Mr. Parker writes me that this species is common in the N.E. Province and N. Province.

Page 1066.—*Nettapus coromandelianus*. According to the same authority, the Goose-Teal is common in the Northern Province.

Page 1070.—*Tadorna casarca*. This Sheldrake can no longer be relegated to the doubtful or unprocured species in the Ceylon lists. Mr. G. Simpson, of the Indian Telegraph Department, has lately sent a portion of the skin of a male shot by him in the Jaffna district to Mr. Parker for identification. He likewise furnishes a description of the bird, which has been forwarded to me, and there is no doubt about the matter. The wing of the example in question measures 14.75 inches. Mr. Simpson says that they are not uncommon in the cool season on the Jaffna lake, near Pooneryn, and on the Delft, Palverainkadoo and Mullaivitivu lagoons. They are, he finds, very wary, flying high when disturbed, and uttering a note like *conk, conk*.

Page 1073.—*Anas poecilorhyncha*. Mr. Simpson has met with this species on the Palverainkadoo lagoon. He likewise is of opinion that he has seen the Mallard in the same locality. I recommend the procuring of this latter species to collectors in Ceylon, so that the doubt may be cleared up.

Page 1092.—*Phoenicopterus roseus*. Mr. Simpson sends word through Mr. Parker of a large flock of Flamingoes having been met with by Mr. Clarke, of the Forest Conservancy Department, on the Jaffna Lake, during June of this year. This interesting record of the occurrence of the species in the island during the S.W. monsoon shows that it is partly resident there. The same gentleman informs me that he has only met with it on the N.W. coast between the months of November and April.

Page 1096.—*Platalea leucorodia*. Mr. Seebohm observed this species, during the recent nesting-season in Holland, breeding in great numbers on the ground. As many as fifty nests were placed within a space of twenty square yards. They were made on large tussocks of grass, the foundation being of sticks, and the body of the nest of reeds, lined with grass.

Page 1103.—*Anastomus oscitans*. Mr. Parker finds the "Shell-eater" common in the vicinity of the Giants' tank.

Page 1109.—*Plegadis falcinellus*. Mr. Wickham, of Holmwood Estate, Lindoola, informs me that he has seen the Glossy Ibis on the Bopatalawa Patnas, and lately procured four specimens! These birds must have been on passage north from the south-east coast; but it is singular that they should cross the mountains and be found at such an elevation, 5000 feet.

Page 1147.—*Bubulcus coromandus*. This species was procured in Sumatra in 1878 by Mr. Carl Bock.

Page 1153.—*Butorides javanica*. Governor Ussher remarks that this Bittern is moderately common on rocks along the sea-shore of Labuan. Its native name there is "*Ulun tukugong*."

Page 1162.—*Ardeiralla cinnamomea*. This Bittern has again been recorded from Sumatra, where Mr. Carl Bock recently procured it.

Page 1182.—*Phalacrocorax carbo*. An interesting account of the training of Cormorants in China has recently appeared in 'The Ibis,' 1880, p. 375. The Editors remark that, though the Chinese species is called *P. sinensis*, it is doubtful whether the bird is "distinct from the *P. carbo* of our seas." I have no doubt but that it is *the same*; it is united with it by Messrs. Swinhoe and David; and in my treatment of the species I have considered it merely a small race like the Indian bird. I append the following extract from the article in question, which originally appeared in the 'Special Catalogue of the Ningpo Collection in the International Fishery-Exhibition at Berlin':—"The young birds are at first fed with a mixture, in equal parts, of beancurd and raw eel's flesh cut fine. If eels are not procurable, the flesh of the *Hei yii* (*Ophiocephalus niger*) is used instead, in the form of small pills. At the end of a month the down begins to be covered by the larger feathers, and the quantity of fish-flesh given to them is increased, while that of beancurd is reduced. A second month elapses, and the young birds, having grown to double their original size, are fit for the market; a male fetches 1 or 2 dollars, and a female half as much.

"The birds are now fed with young fish thrown to them. When they have attained their full size, a string is tied to one leg, the other end of it being fastened to the bank of a pond or canal. They are then made to go into the water, the trainer whistling a peculiar call and using a bamboo to force them. Small fish are thrown them, upon which they pounce greedily, as they have been kept on short allowance of food. They are now called back by a different whistle-call, and forced to obey by means of the string; as they reach the shore more fish is given them. This teaching having been gone through daily for a month, another four or five weeks are spent in training the birds from a boat; at the end of this period the string is generally dispensed with. When old and well-trained Cormorants are made to accompany the young ones, the time required in training is reduced one half. Birds not properly trained after all the trouble thus taken are pronounced stupid and not fit for use.

"The teaching being completed, the Cormorants are fed sparingly every morning with fish. A small ring of hemp is tied around their necks to prevent them swallowing large fish, and they are taken on board the small punt called 'Cormorant-boat' to the number of ten or twelve. They are now as docile as dogs, and sit perched on the side of the boat until they are sent into the water by a mere whistle from their master. They dive after fish, and bring their prizes to the boat, firmly held in their hooked beaks. When a fish is too large for one bird, three or more join their forces and capture it together. Sometimes the fisherman signals them to dive by striking the water with a long bamboo. If any Cormorant is inclined to be disobedient, his legs are connected by a short piece of string; this forms a loop, by means of which the bird may at any moment be brought on board, *volens volens*, with a long bamboo hook.

"After fishing two or three hours the birds are allowed to come on board and rest. At the end of the day the hempen ring is loosened or removed altogether, and they are either allowed to fish for themselves, or are fed by the hand of their master. Seizing the birds one after another by the upper mandible, the fisherman thrusts into their throats a handful of small fish and a ball of beancurd as large as his fist, the ingurgitation of which he helps with the other hand by stroking the neck of the bird, who seems to enjoy it, as he promptly returns for a second supply. The entire scene is most ludicrous. At night the birds are brought home and caged. A Cormorant holds out for five years, at the end of which time these birds lose their feathers and soon after die. The females, being weaker than the males, only catch small fish, hence their lower value. Very good birds reach a value of £ls. 10 a pair, a well-trained male being worth 6 or 7 dollars. The females lay when one year old."

APPENDIX II.

Pages 205, 1212.—*Brachypternus intermedius*. In view of the evidence sent me by Mr. Parker, on reconsidering the matter I have added this species as a *bond fide* one to the Ceylon lists; but whether it will stand under the above name, and as *peculiar* to Ceylon, I cannot say with certainty.

Page 272.—*Anthracoceros coronatus*. This Hornbill breeds in the N.W. Province in April, choosing a Koombook-tree sometimes to nest in. An overseer of Mr. Parker's found a nest in the beginning of April of the present year. It was in the trunk of a tree about 15 or 18 feet from the ground; the hole was plastered up, leaving a small opening. There were two eggs, much discoloured, in the hole.

Pages 275, 1213.—*Tockus gingalensis*. A nest found in April last near Ballalli, N.W. Province, was situated in a large Koombook-tree, in a hole about 20 feet up the trunk from the ground; the orifice was plastered up so that there was barely space for the introduction of the hand. In the nest were imprisoned the mother and three young ones, two of which were so far advanced as to be able to fly! It is surprising that they were still undergoing imprisonment. The nest was found by a trustworthy *employé* of Mr. Parker's, who vouches for the truth of the man's statement.

Pages 303, 1213.—*Ceyx tridactyla*. Mr. Parker writes me of finding the nest of this beautiful species, the first that has been discovered in Ceylon. It was situated in the side of a small streamlet near the Aruvi aru; the depth of the hole, which sloped slightly upwards, was 18 inches and its diameter 2 inches, while the cavity where the eggs were deposited, and in which there was no nest, was 3 inches high and 5 inches in diameter. The eggs were three in number, pure white, and with the ends not so round as in other species; they measured 0.77 by 0.6 inch. The date of finding the nest was July 23rd.

Pages 328, 1214.—*Dendrochelidon coronatus*. The same gentleman was fortunate enough to find, on the same day, one of the beautiful and diminutive nests of this Swift. It was so small that when he perceived the bird sitting across a small branch of a young tree no nest was visible; but when she flew off something like a small excrescence or knot projecting on one side of the branch could be perceived. The nest was *one inch* in internal diameter and half an inch deep, and was constructed of tiny bits of the outer bark of trees, agglutinated together with the bird's saliva. The branch was not more than 1½ inch thick; and when the bird sat on the nest the whole of the breast on one side of it and the under tail-coverts on the other were visible, showing how exceedingly small was the nest. It contained one young one, which entirely filled it.

Pages 366, 1214.—*Pericrocotus peregrinus*. Eggs of this little Minivet, sent me by Mr. Parker, vary somewhat. One specimen is greenish white, spotted with number and dark brownish purple, these markings forming a zone round the large end, and becoming very small and scanty on the smaller half of the shell; the underlying markings are bluish grey and very small. The specimen is characterized by the openness and smallness of the spots; it is of the usual ovate-pyriform shape, measuring 0.72 by 0.51 inch. Another example is white, with rather large longitudinally directed spots of pale red of two shades overlying largish spots of bluish grey. The markings, though largest at the obtuse end, are pretty evenly distributed over the whole surface. It measures 0.68 by 0.52 inch, and is much more stumpy in shape than the last-mentioned. These eggs are accompanied by one of the nests alluded to, p. 1214. The entire structure measures only 2 inches across by 1½ in depth, and is exceedingly beautiful, the spiders' webs binding the stalks together being mixed with wild cotton and feathers; there are a few pieces of tiny twig in the body of the nest, and there is no lining, the interior being much rougher than the neatly finished-off edge of the "eup."

Pages 372, 1214.—*Tephrodornis pondicerianus*. An egg of this Bush-Shrike, received from Mr. Parker, is a very short broad ellipse in shape, covered with very large markings for the size of the egg, and which consist of blotches and spots of olive-brown, with some streaky markings of the same at the small end; beneath these lie numerous blotches of greyish blue, collected chiefly at the large end. The egg measures 0·77 by 0·64 inch.

Pages 383, 1215.—*Lanius caniceps*. Eggs of this Butcher-bird which have arrived in England since the above note (p. 1215) was written are white faintly tinged with green, and openly spotted with clearly-defined, roundish, medium-sized spots of brownish lilac and greenish brown, over smaller spots of pure bluish grey; the spottings are thicker and larger at the obtuse end, but are not confluent at all there. They are short thick ovals, rather obtuse at the large end, and measure 0·92 by 0·71 and 0·91 by 0·69 inch.

Pages 449, 1215.—*Turdus kinnisi*. The British Museum has just acquired a most valuable addition to its Oriental collections, viz. a series of birds collected in the Travancore hills by Mr. Bourdillon. Among them is a specimen of the Blackbird referred to in my "Observation," p. 450, and with which, owing to Mr. Hume's remarks, I was led to unite our bird. Messrs. Sharpe and Seeborn, however, pronounce the specimen in the national collection to be distinct from the Ceylonese bird. I therefore accept their dictum and restore *Turdus* (*Merula*) *kinnisi* to its rank as a "peculiar" Ceylonese species, and regret now that I did not figure it at the time of writing my article. Only two specimens of the Travancore bird have been procured by Mr. Bourdillon—the one in the British Museum collection, and one which Mr. Hume has, and which I formerly referred to.

Pages 574, 1217.—*Dicæum erythrorhynchum*. The nest alluded to in my note p. 1217 has been sent to me, and is an exceedingly beautiful little structure. It is a "purse" domed at the top, and with the opening just beneath the dome about $\frac{3}{4}$ inch in diameter. The length of the nest is about $2\frac{1}{2}$ inches, and its breadth 2 inches. It is chiefly made of native cotton mixed with very fine bark-fibres, particularly round the orifice. The interior is entirely cotton.

Pages 718, 1218.—*Carpophaga ænea*. A nest of this Pigeon, found near the Giants' tank by Mr. Parker, July 21st, was built in the top of a young leafy tree; it was slightly more substantial than the nest of the Pompadour Pigeon, and was considerably thicker. It contained one egg, which measured 1·65 by 1·30 inch.

Pages 728, 1218.—*Osmotreron pompadora*. An egg just received from Mr. Parker, taken at the Giants' tank, is a short very broad ellipse, pure white, with a little gloss and a *slightly* rough texture, and measures 1·02 by 0·88 inch. It is small for the size of the bird. The breeding-season in the north extends to the end of July.

Page 1217.—*Alauda parkeri*. Mr. Hume writes me, since the note on p. 1217 was written, that the specimen I sent him of this bird is the young of the southern form of *Alauda gulgula*. The bills, however, of this specimen and another are so very large and conical (much exceeding in thickness the largest full-grown examples of *Alauda gulgula*) that it is difficult to accept Mr. Hume's identification. Nevertheless, as I know this species varies so much in the bill, I will expunge this supposed species from my list of peculiar birds in the Introduction; but will allow it to stand as a doubtful species in the "Systematic Index."

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